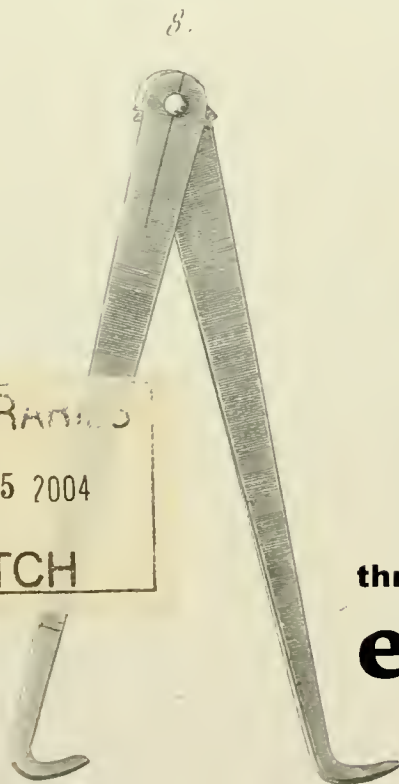
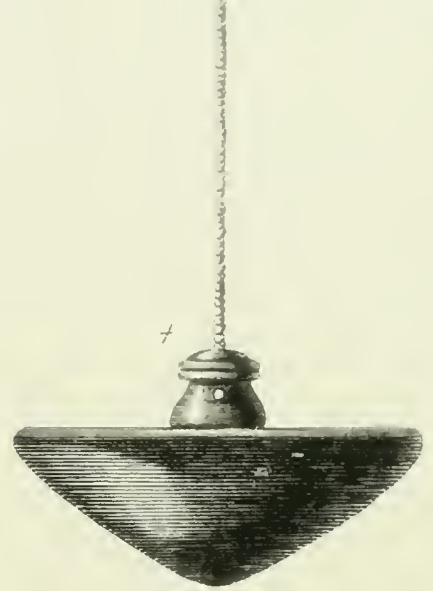
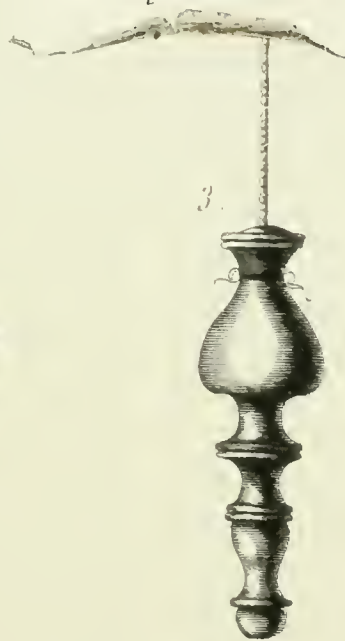
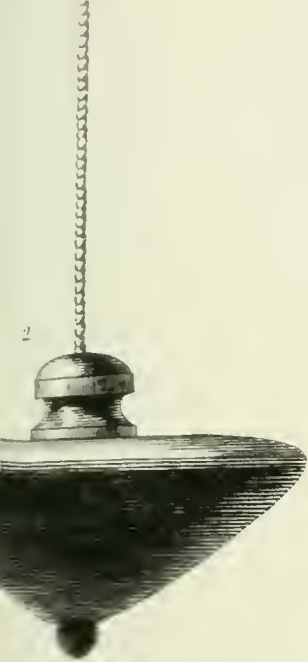




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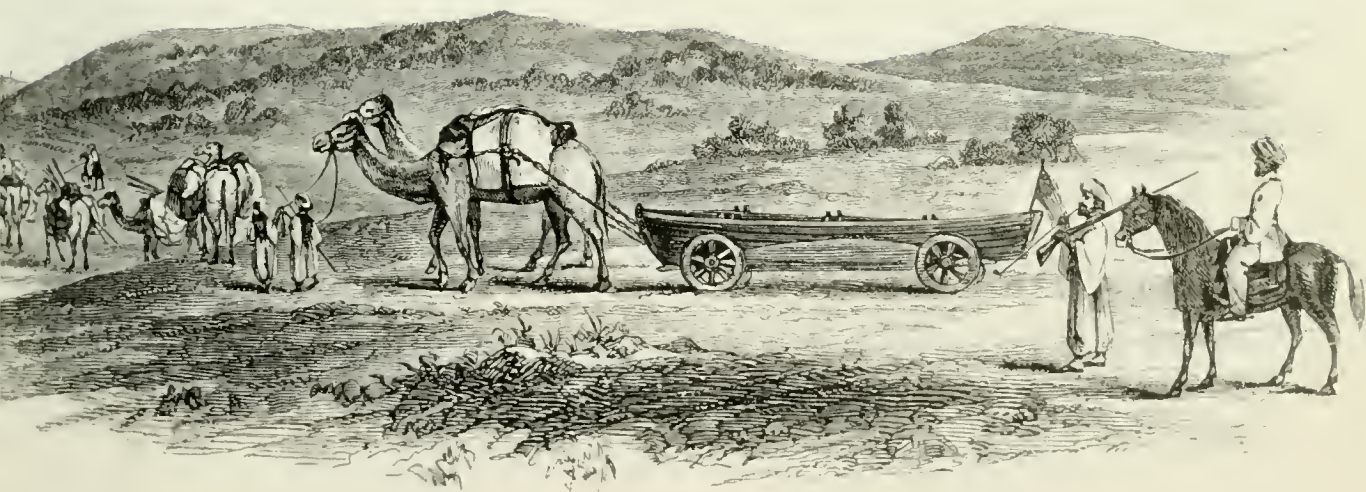
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Title page image. From William Francis Lynch, *Narrative of the United States' Expedition to the River Jordan and the Dead Sea*, (Philadelphia: Lea and Blanchard, 1849)



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Editorial Policy

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EXPEDITION

Lauren Kroiz

Introduction

You get to the top, the sun breaks over the mountains, and everything is yellow and everybody gasps and sees how incredible the world really is. And at that moment it's all worth it. Then everybody gets on the SatPhone and calls their mother.

Promotional brochure for GM's *Hummer H1*
model Sports Utility Vehicle, 2003

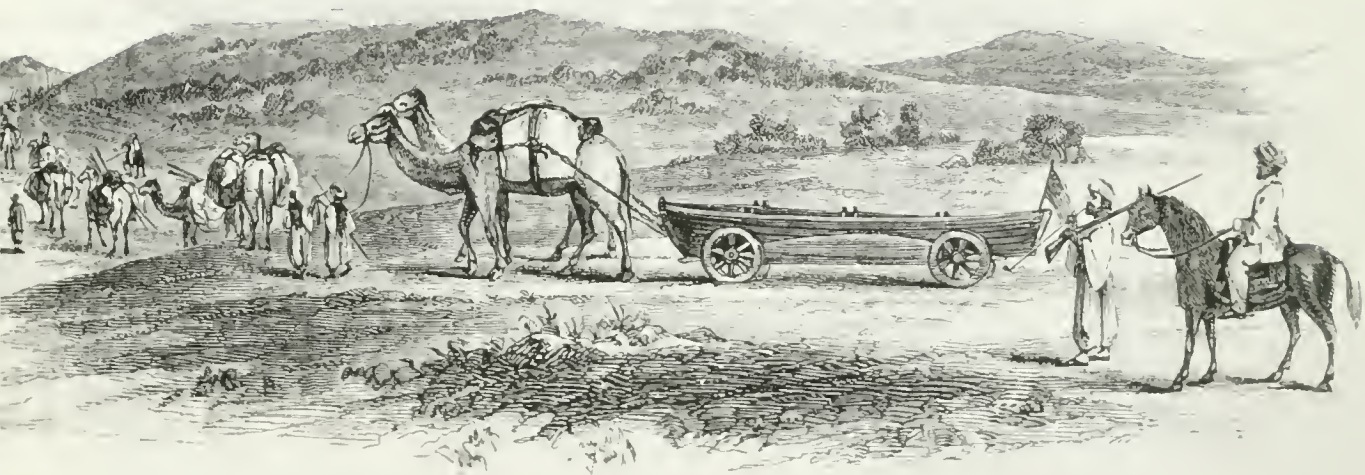
In civilizations without boats, dreams dry up, espionage takes the place of adventure, and the police take the place of pirates.

Michel Foucault, "Of Other Spaces," 1967

Boats or boredom. Michel Foucault's call for adventuresome pirates seems remarkably close to auto companies' recent allusions to our desire for an *Expedition* or an *Explorer* in the driveway ready to take us somewhere incredible. Sports Utility Vehicles and their exploratory nominations suggest a mass fascination with narratives of persistence in the face of hardship and a commitment to discovery of the "new" outside the everyday. (Figure 1) While we may be thankful that few Americans still drive the Chrysler *Imperial* (produced from 1926-1993), we must ask if the legacies of imperialism and exploration are essentially so different. This issue of *thresholds* aims to reintroduce everyday political and social concerns to the practice of exploration, in a way hitherto largely neglected. If, as Heghnar Watenpaugh suggests in her essay, it is possible to historicize concepts like Orientalism (the travel to and representation of the East by westerners), we can also begin historicizing the work and art of early explorers, as well as their legacy in our explorations today.

The lasting legacy of exploring is often covered in hazy memory, that is, if it is not memorialized forever in the colonization of "new" territory. Emblematic of the forgotten history of exploration which this issue of *thresholds* seeks to recover, is one historical event. The web of religious and economic factors of current US policy in the Middle East may be traced beyond 1948 to July of 1847, when William Francis Lynch received naval approval for the *United States' Expedition to Explore the Dead Sea and the River Jordan*. The expedition planned to chart the Jordan, suggesting that it might be possible to use the river to advance US commercial interests in the Middle East. The

Figure 1
(facing page)



CARAVAN OF THE EXPEDITION.

Figure 2. "Caravan of the Expedition"

mission would also be the first to chart the bottom of the Dead Sea, a body of water which was thought to cover the ancient damned cities of Sodom and Gomorrah. Landing in Jaffa, the party marched overland to the river, flying the American flag the entire way. (Figure 2)

Near the end of their journey, Lynch's expedition discovered a pillar of salt on a cliff above the Dead Sea. (Figure 3) Disembarking to examine it first-hand, Lynch noted that the composition "of solid salt, [was] capped with carbonate of lime...covered with debris of a light stone color."³ It was structurally "cylindrical in front and pyramidal behind ...slightly decrease[d] in size upwards, crumbled at the top, and is one entire mass of crystallization...its peculiar shape is doubtless attributable to the action of the winter rains."⁴ In addition to these empirical observations, Lynch also cited in a footnote the accounts of a similar pillar of salt by Josephus, an author born

in 37 AD, and Clement of Rome, both of whom had seen such a pillar and assumed that it was the one into which Lot's wife was transformed. Quoting another ancient text, Lynch recounted a traditional explanation that "as fast as any part of this pillar was washed away, it was supernaturally renewed."⁵ The textual narrative of the pillar's discovery and meaning invoked both empirical and apocryphal explanations.

The expedition obsessively measured the mineral levels and looked for life in the Dead Sea. They floated themselves and their horses on the miraculous water, all the while pondering the damned cities of Sodom and Gomorrah beneath. For Lynch, even empirical observation of the landscape recalled biblical scenes. Lynch emphasized the resemblance between the hardships of explorers and the trials of early saints and pilgrims. The vividness of his descriptions operated as simultaneously religious and scientific:



Figure 3. "Pillar
of Salt at Usdum"



To the south was an extensive flat intersected by sluggish drains, with the high hills of Edom semi-girdling the salt plain where the Israelites repeatedly overthrew their enemies; and to the north was the calm and motionless sea, curtained with a purple mist, while many fathoms deep in the slimy mud beneath it lay embedded the ruins of the ill-fated cities of Sodom and Gomorrah. The glare of light was blinding to the eye, and the atmosphere difficult of respiration.⁴

In the overdetermined area around the Dead Sea, it was as if sluggish drains and slimy mud were interspersed with Israelites, the cities Sodom and Gomorrah, all leading Lynch to explore and represent the religious and scientific with the same tools.

Like many explorers of the period, the “savage” surroundings often caused difficulties in vision. In one particularly striking passage, Lynch wrote, “the men, clos[ed] their eyes to shield them from the fiery blast...My own eyelids were blistered by the hot wind, being unable to protect them, from the necessity of steering the boat.”⁵ From the great depths of the Sea, often exploring narrow chasms, Lynch chronicles the difficulties of using his scientific instruments like the sextant.⁶ (Figure 5) This final example of the conflation of the scientific explorer and the religious pilgrim and saint opens the intriguing possibility that Enlightenment chronicles of discovery may have filled the gap left by saint hagiography in our secular age.

Lynch’s expedition was a huge failure. It turned out that the Jordan was practically impossible to navigate, being both winding and shallow. Politically, Lynch suggested that the US might do well to support the nomadic Bedouin against the “decadent” Arabs, but these plans too came to naught at the breakout of the Civil War. However, the narrative of the expedition became a bestseller, fusing scientific exploration and a tradition of pilgrimage to the Holy Land.

Lynch’s account, as well as those of other early travelers to the Middle East, Asia, South America, and many places in between, cited the lack of curiosity in the “natives” as proof of indigenous peoples’ “inferiority.” After all, who had “discovered” whom? Recently, Gavin Menzies, an amateur historian and former submarine commander in Britain’s Royal Navy, became a brief media sensation for his book *1421, The Year China Discovered America*, which claimed that the Chinese under Zheng He had actually discovered the California shore seventy years before Columbus. News commentators expressed disbelief, as if traditions of exploration outside of Europe seemed impossible. In this issue of *thresholds*, Chris Csikszentmihályi enters into this debate of the West viewing the non-West, utilizing mechanical mediation to push these notions to the point of absurdity. He

Figure 4.
Map of the Dead Sea produced by Lynch’s expedition



Figure 5. "Wady
Moheb"

applies the paradigms of space exploration to areas of our own planet in order to, as McKenzie Wark has suggested, raise an "ironic tangent, displacing the terms within which one may think about the event."⁷

In scientific practice, at a remove from questions about the Other, politics and economics seem to disappear below a progressive account of determining the rules of the universe. Yet historians of science, including Peter Galison interviewed in this issue, remind us that this formulation is a myth; scientific frontiers are always tied to social relations of power.

Referencing the importance of exploration to another supposedly autonomous discipline, Neyran Turan notes the clear tie between the charting of the North Sea and the commercial interests in natural gas and oil. Mapping often appears as the simple representation of existing forms, yet, as Lynch's mission and Turan's account of the more recent explorations of the North Sea demonstrate, geography is similarly tied to social factors of production.

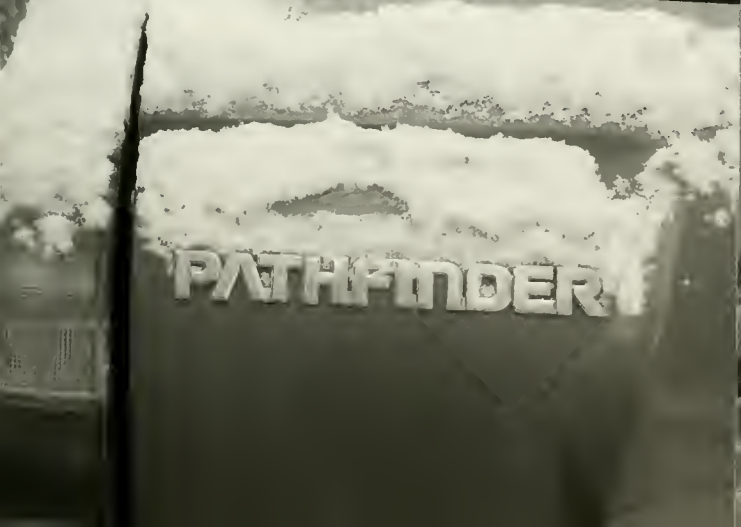
Martin Hogue's chronicle of his travel to earthworks across the US reminds us of the multiple scales and destinations

inherent in travel. He not only marks the time and distance, but also indexes the car maintenance and movies attended.” Lisa Hsieh and B. Alex Miller explore the familiar territory of the urban apartment and the suburban house to offer new design “solutions.”

As Bridgette Desrochers points out, society only makes “discoveries,” be they of artifacts or of “new” lands when it is politically and economically advantageous. As an example of this economic dependency, Jed Ela’s work implicates the economic motivations on the frontiers of consumerism that underlie the development of new materials in architecture and elsewhere. If explorers, both of scientific and geographic frontiers, are saints of the Enlightenment, this issue of *thresholds* aims to divert a romantic view of explorers on the “frontier” ravaged by hardship and to take part in a critical discussion of what it means to envision ourselves as explorers or pioneers, allowing us to confront familiar objects in the guise of explorers, trailblazers, or pathfinders.

Notes

1. William Francis Lynch, *Official Report of the United States' Expedition to Explore the Dead Sea and the River Jordan*, (Washington, D.C.: The National Observatory, 1852), 43.
2. *Ibid.*, 307.
3. *Ibid.*, 308.
4. William Francis Lynch, *Narrative of the United States' Expedition to the River Jordan and the Dead Sea*, (Philadelphia: Lea and Blanchard, 1849), 310.
5. *Ibid.*, 312.
6. *Ibid.*, 309. “At 11.28, we were unable to proceed farther south from shallowness of the water. With great difficulty landed to take a meridian altitude; but the sextant would not measure it.” *Ibid.*, 315.
7. McKenzie Wark “Robot Journalists and the Ironies of the Tactile Intellectual,” *The Weird Global Media Event and the Tactical Intellectual*, *nettime*, May 15, 2002, <http://amsterdam.nettime.org/Lists-Archives/nettime-l-0205/msg00093.html>.



Hélène Lipstadt

“To See, to Record, to Photograph”

Discovering Pierre Bourdieu’s Rediscovered Photographs of the Berber House, Uncovering Architecture as an Intellectualist Art

In a historical situation [Algeria, 1958-1960] in which in every moment... the whole reality was at stake, it was absolutely necessary to be at the heart of events and to form one’s own opinion, however dangerous it might have been and dangerous it was. To see, to record, to photograph: I have never accepted the separation between the theoretical construction of the object of research and the set of practical procedures without which there can be no real knowledge.

Pierre Bourdieu, “The Struggle for Symbolic Order,” 1986

Architecture, a very intellectual or intellectualist art.

Pierre Bourdieu, “Habitus,” 2002

Pierre Bourdieu (1931-2002) was a world-renowned sociologist whose forty books and three-hundred articles were inseparable from the campaigns against the instruments and institutions of social domination that made him France’s leading public intellectual.¹ He is probably best known for his sociology of culture; that of museums, painting, literature, and taste; for his methodological trioka of capitals, field and the habitus, (or a system of dispositions); and for his epistemological and philosophical project of objectivation. In architecture, however, his fame was secured by his short essay, “The Berber House or the World Reversed.”² That study of the *maison kabyle*, the traditional house of a Berber-speaking people of Northeastern Algeria, is a mainstay of architectural teaching and is frequently cited in studies of the anthropology of architecture and in the historiography of Islamic domestic architecture, where its relevance as a model for Islamic domestic architecture is both enthusiastically proposed and used, but then sometimes vigorously contested.³ In 2003, just one year to the day after Bourdieu’s death, the

photographs taken during his field work in parts of Kabylia and in Algeria in the period 1958-1960, the residue of several thousands (the majority of which was subsequently lost), were exhibited and published. Among them were several photographs of the different habitats of the Kabyle, including the *maison kabyle* of the reversed world.⁴

The publication of these particular photographs presents an opportunity and a reason to rediscover the original Kabyle houses, as Bourdieu saw, recorded, and photographed them. More generally, it allows students of architecture to cross the threshold into the epistemological and methodological world where Bourdieu made his conversion from philosophy to ethnosociology, to the world that he would later reverse by engaging in a self-reflexive critique of the methods and minds of all scholars (including his own) that he called the objectivation of objectivity. (Figure 1) The photographs are both evidence and emblem of this return on himself that had lasting methodical consequences for him and for the many who follow him in employing his “sociology as a martial art,” a tool with which both to comprehend practice and power and to combat domination—social, cultural and political.⁵

Bourdieu’s ideas of the habitus and of a logic of practice were prefigured in the essay on the Kabyle house. The concepts, he believed, would be of special value to students of architecture, for architecture was, he said, “a very intellectual or intellectualist art.” Intellectualism, which he also called theoreticism or scientism, impedes an understanding of the “fuzzy logic” that allows people to be masters at what they do without full conscious knowledge of why they do it. Intellectualism logically afflicts scholars who are analysts of art, for their interest in creation, in design naturally leads them to privilege the work, the *opus operatum* at the cost of the *modus operandi*, the mode of production, “the manner of acting, the art in the etymological sense, that the artist ...brings into work. This art, this manner of doing... is a practical mastery without theory, without theoretical mastery of practical mastery. The notion...necessitate[s] and effect[s] a radical break with the scholastic fallacy that threatens most of the analysts of art, as...scholars....The scho-

lastic bias is the tendency, very common among scholars, to put a scholastic mind, a scholar's mind into everyone's head."⁶

The Kabyle House Essay as Self-reflexive Critique of Intellectualism

In the essay, Bourdieu analyzes the Kabyle house space and village space, weaving into it his understanding of movement through them and use of them, enriching the analysis through references to Kabyle proverbs about those objects and practices. Bourdieu identified the structure of the Kabyle mythico-ritual system and the house as a "microcosm" of the Kabyle cosmos, "a miniature world," but an inverted one. He made sense of the spaces, uses, and qualities organized around oppositions: beam and pillar; high and low parts of the house; the placement of the rifle and of the loom; day use and night use; goings and stayings; dry and wet; public and private and, correspondingly, of persons and their meanings: men/women; male honor/female honor; the fertilizing male/the female able to be fertilized. When the entire interior space is replaced in the total outside space, that space receives a symmetrically opposite signification. Both spaces, interior and exterior, are derived from each other through a 180-degree rotation at the threshold on the front façade of the house, which functions as a magical pivot. Thanks to it, the house possesses two cosmologically favorable Easts, one inner, one outer, allowing women to move around the hearth inside the house toward their East and men to leave the house towards theirs. However, the symmetrical and inverse spaces are not equal, as Bourdieu concludes: "the orientation of the house is fundamentally defined from the outside, from the point of view of men by men and for men,"⁷ for the threshold on which the world inverts is reserved for them, as is movement over it toward the outside, the space of the assembly, the mosque and the fields.

The 1970 essay is a virtuoso performance of the very structuralist anthropology that Bourdieu would later renounce and even denounce. But it was never only structural anthropology, for his interest in time and the embodiment of the social and domination are at work in it. Moreover, it came with methodological instruction meant to prevent its generalization into a theoreticist theory, separated from its empirical basis in practice. Thus Bourdieu wrote that the "degree to which a mythico-ritual system depends on other systems and the form that dependence takes varies from society to society."⁸ "Other systems" meant the "constraints of technique," including siting. (Figure 2) Subsequently, he admonished that a concentration on the mythico-ritual space itself, or the *opus operatum*, comes at the cost of attention to the *modus operandi*. He included the maison kabyle essay in his methodological masterwork, *The Logic of Practice*, but only as an appendix, so that it might be read as an object lesson in how to advance beyond the essay through self-reflexivity to the objective of understanding practice. (Figure 4) Its value as an appendix was to "give an idea of the objectivist



Fig. 1. Pierre Bourdieu. Photograph of a house in a Kabyle village, Ain Aghbel, Cotto. Earthenware furniture created by women, who shape it with their own hands and decorate it with snakes, the representation of resurrection. Bourdieu cited the significance of the act of photographing these particular houses in his self-reflexive critique of 1980. (Pierre Bourdieu / Fondation LIBER, Genf. Courtesy: Camera Austria, Graz.)

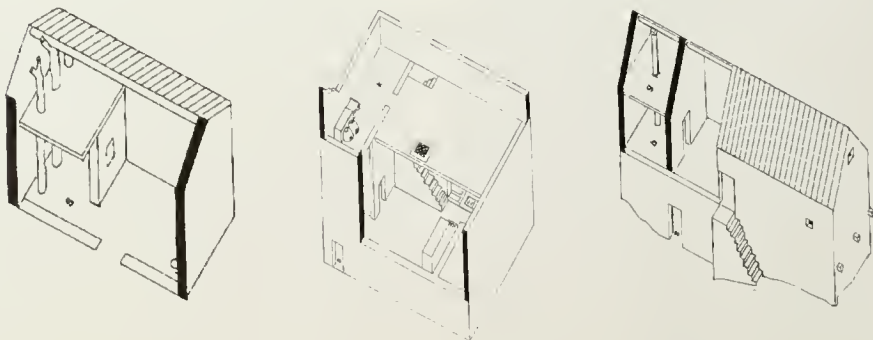
reconstruction of the system of relationships that was a necessary stage in moving to the final interpretation." A theoreticist reading of the essay is also a dehistoricized reading of the essay, for it fails to recognize that in 1980 Bourdieu repudiated it as "his last work as a blissful structuralist."⁹

Photography and Ethnography in Time of War

It was in the photographs that Bourdieu himself rediscovered when writing *Logic of Practice* that he found compelling proof of the costs of practicing blissful structuralism. To understand the photographs, one must also understand the "dangerous conditions"¹⁰ in which they were taken. Bourdieu was at "the heart of events" from 1955 to January 1960, first as a draftee, then, after 1958, as a young "assistant," or very junior professor of philosophy and sociology, at the University of Algiers. He left Algeria in the autumn of 1959, alerted to the fact that the French army had placed him on the "Red List" of "liberals" suspected of aiding the revolutionaries.¹¹ He was thus marked for arrest and possible torture. In the period in which Bourdieu was under arms, Algeria was divided into three zones, one of combat, one of police action, and a "forbidden zone" that was

“The situating of the house in geographical and social space, and also its internal organization, forms one of the ‘places’ in which symbolic or social necessity and technical necessity are joined. It is perhaps in cases such as the one here, where the principles of symbolic organization of the world cannot be fully applied and have, as it were, to come to terms with external constraints, such as the constraints of technique, for example, which require the construction of the house perpendicular to contours lines or facing the rising sun (or in other cases, the constraints imposed by social structure which demand that every new house be built in a particular area defined by genealogy) that the symbolic system reveals its capacity to reinterpret, in terms of its own logic, conditions proposed to it by other systems. Without wishing to become further involved in an extremely difficult debate, it might be suggested that the degree to which a mythico-ritual system depends on other systems and the form that dependance takes varies from society to society.”

- “The Berber House or the World Reversed,” 153, n. 5.



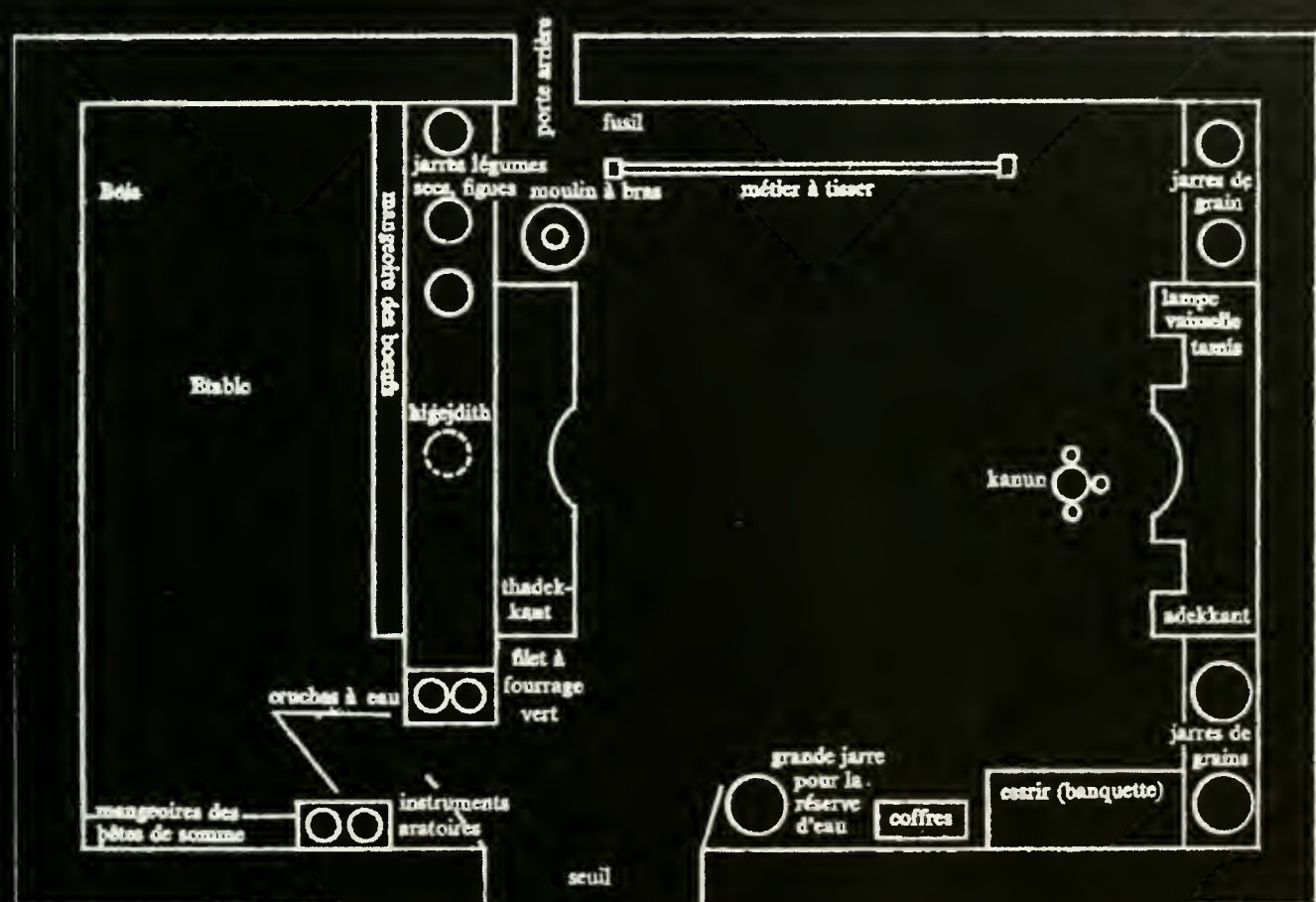


Figure 2 (left). Berber houses in Kabylia, Algeria; the Rid, Morocco; and at Chadames, Libya. The plan of Bourdieu's *maison Kabyle* was specific to Kabylia in Algeria, although the central room predominates in Berber houses throughout North Africa.

Figure 3 (above). Plan of the *maison Kabyle*, from *Le Sens pratique*, 1980. Bourdieu's original plan, drawn in the field, is reproduced in *Images d'Algérie*. (Pierre Bourdieu / Fondation LIBER, Genf. Courtesy: Camera Austria, Graz.)

Figure 4 (left). Footnote to "The Berber House or the World Reversed"



Figure 5. Pierre Bourdieu, Aïn Aghbel, Collo. The tall, forked form is the *thigejith*, the central pillar identified with the wife and support for the entire framework. Abdelmalek Sayad, Bourdieu's then student and future co-author and later a renowned sociologist of Algerian emigration, can be seen beside it. The unidentified figure outside the house stands before the threshold, the pivot for the reversal of the world. (Pierre Bourdieu / Fondation LIBER, Genf. Courtesy: Camera Austria, Graz.)

emptied of its inhabitants. It was in the "forbidden zone" that Bourdieu first encountered the *maison kabyle* that had been described to him by its exiled inhabitants. (Figure 5)

There was nothing unusual in Bourdieu's decision to bring a camera to Algeria; many draftees did so.¹² Bourdieu came to Algeria as a practitioner of what he would later call that art of "the man in the street" in his 1965 study of amateur photography.¹³ He was already a shutter bug, to use the American slang of the period, the owner of a Zeiss Ikonflex (bought for the excellence of its lens) and a Leica. It was only when Bourdieu, who had been trained as a philosopher, converted to ethnography, that the photographs he had been taking for his own amusement and because of the great affection, even tenderness, that he felt for the people, became part of his scholarly project.¹⁴ Hence-

forth, his photographs were taken for the immediate purpose of documentation, in order to record the ephemeral and transport the immovable, in rural and urban contexts. They are primary ethnographic documents, one scientific instrument among the many used by Bourdieu to produce his ethnosociology. Their purpose was to record the traces of a foreign universe in a manner consistent with the method of objectivation that Bourdieu would later make his own. In the book published posthumously, the photographs were divided into five themes, each drawn from Bourdieu's Algerian writings of the 1960's: "War and Mutation," on the photographs of the military presence and the 1958 elections; "Habitus and Habitat," on those of the building of the Resettlement camps and the way people lived in them, as well as on the habitats left behind, including the destroyed Kabyle houses; "Displaced Peasants," on the agricultural activities that continued in the camps; and "Men and Women," on genders relations. Finally, the "Economy of Misery" recorded the encounter of the displaced peasants with Algiers and its *bidonvilles*, or slums. There he studied urban practices, again of men and women in the most ordinary of circumstances. For example, he paid close attention to the study of dress, both European and traditional, and to how people moved in the street. Finally, in the small city of Blida, he took up the position of street photographer, using his still camera as if it were a movie camera, systematically photographing the passers-by. The Ikonflex, with its viewfinder on top of the camera body, gave him a distinct advantage in a country where photography of women could be an offense, and it may be for that reason that he preferred it to the Leica, which he used little, if the surviving photographs are any indication. The desire to photograph discretely may also explain why Bourdieu often used a low angle of vision when photographing.

Photography was an instrument of discovery: it made him more acutely aware of others, of himself, and of the defects of scholarship, especially of its self-absorbed "scienticism." The photographs of the Kabyle House capture that scienticism:

The roofs of the house had been removed to force people to leave. ...There were these jars...these large jars that hold grain, decorated jars...And thus I was very happy to be able to photograph despite the disastrous situation, and that is very contradictory. I was able to take photos of these immobile houses and their furnishings because they no longer had any roofs. And this is something very typical of my experience there, that was also something quite extraordinary: I was quite overwhelmed, very aware of the suffering of these people, while at the same time there was the detachment of the observer, manifesting itself by the fact that I was the photographer.

This was all the more true for the Kabyle house whose plan Bourdieu published, for it was situated in a part of the forbid-

den zone where “he was under the control of men who had the power of life or death,” and Bourdieu had risked not only his life but that of his students to go there. Is it any wonder that the initial rediscovery of the photographs of the roofless houses around 1980 caused him once again “to question the deep-rooted determinants of a so obviously “misplaced” *libido sciendi*.”¹⁵ Photographing the disasters of war allowed a self-distancing from that disaster, a protection from it in the name of scholarship, of science and its impulses and imperatives.

Self-Discovery and the Intellectualist Art

Although taken during the war, these are not war photographs. Although the work of an amateur in a foreign country, they are not travel photographs. Although shot by someone who later termed his Algerian work as “bizarrely falling between Orientalism” (the French discipline of the study of Islam and other non-Western civilizations) and “ethnology” (reserved for the study of “primitive people”), they are not Orientalist, in the aesthetic sense of the term.¹⁶ They also lack the *mis-en-scène*, the staging, and the preference for the big picture with a cast of hundreds, that are characteristic of the generally otherwise admirable ethnographic photographs of Algeria of Thérèse Rivière of the 1930s.¹⁷

But they are not merely ethnographic photographs, for they are also photographs of self-discovery. The photographic view is the analogue of his sociological view. Photography was the method that allowed Bourdieu to keep the distance he needed for scientific work, that of objectivation, while requiring from him a consciousness of that distance and of the shortcomings of social scientific claims to objectivity. This double distancing, a moving away from others that obliges a moving away from one’s own situation with regard to what one is studying, also sustained him when he witnessed the enormous sufferings of people for whom he felt a strong affinity.

Notes

1. I am grateful to Gisèle Sapiro of the Centre de Sociologie Européenne and Stanford Anderson, and the Department of Architecture for the opportunity to attend the 2003 conference, Homage à Bourdieu, and to see the photographs; to Xing Ruan and the Society of Architectural Historians and Nasser Rabat and the Aga Kahn Program in Islamic Architecture at MIT for earlier opportunities to work out my thoughts on Bourdieu’s photographs and the Maison Kabyle; and to Clifford Geertz for an illuminating explanation of the maison Kabyle. Franz Schultheis and Christine Frisinghelli are thanked for their patient answers to my questions. See also, Hélène Lipstadt, “Pierre Bourdieu. Images d’Algérie. Une affinité élective. Organized by Fondation Liher and Camera Austria, *Journal of the Society of Architectural Historians* 63, no. 1 (March 2004): in press.
2. Pierre Bourdieu, “The Berber House or the World Reversed,” *Social Science Information* 9, no. 3 (April 1970): 151–70 is the first publication of the essay in English. A “slightly modified version” is “Appendix: The Kabyle House or the World Reversed,” in *The Logic of Practice*, trans. Richard Nice (Stanford: Stanford University Press, 1990), 271–B3, 316, n.1. “The Berber House,” in *Rules and Meanings: The Anthropology of Everyday Knowledge*, ed. Mary Douglas (New York: Penguin, 1973), 98–110 is an almost footnoteless excerpt from which essential methodological footnotes and sections dealing with gender differences have been omitted.
3. The fact that the specificity of the *maison kabyle* to Kahylia has been overlooked has caused authors to use it as a universal model, then to contest it. See Michael Brett and Elizabeth Fentress, *The Berbers* (Oxford: Blackwells, 1996), 241–43, fig. 7.3, for distinctions between different Berber houses and between those and Arab dwellings.
4. Pierre Bourdieu, *Images d’Algérie: une affinité élective*, work conceived by Franz Schultheis and Christine Frisinghelli, “Archives Privées” (N.p.: Actes Sud/Camera Austria/Fondation Liher, 2003) is the posthumously published collection of what survives from Bourdieu’s photographs of Algeria.
5. Pierre Carles, dir., *La sociologie est un sport de combat: Pierre Bourdieu* (Montpellier, France: C-P Productions, 2001).
6. Pierre Bourdieu, “Habitus,” in *Habitus 2000*, ed. Jean Hillier and Emma Ronksby (Ashworth, 2002), 32. For the implications of Bourdieu’s definition of architecture as an art, see Hélène Lipstadt, “Can ‘Art Professions’ be Bourdieuan Fields of Cultural Production?: The Case of the Architecture Competition,” *Cultural Studies* 17, no. 3/4 (May 2003): 390–419 and for the application of that methodology to an architecture competition, see “Co-Making the Modern Monument: The Jefferson National Expansion Memorial Competition and Saarinen’s Gateway Arch,” in *Modern Architecture in St. Louis: Washington University and Postwar American Architecture, 1948–1973*, ed. Eric Mumford (Chicago: University of Chicago Press, 2004), forthcoming.
7. Pierre Bourdieu, “The Berber,” 169.
8. Pierre Bourdieu, “The Berber,” 153, n. 5, translation modified. Cf. fig. 4.
9. Pierre Bourdieu, *The Logic of Practice*, trans. Richard Nice (Stanford: Stanford University Press, 1990), 316, n.1, 9.
10. Pierre Bourdieu, “The Struggle for Symbolic Order,” with Axel Honneth, Hermann Kocbya, and Bernd Schwibs, *Theory, Culture & Society* 3, no. 3 (1986): 39.
11. Tassadit Yacine, personal conversation with author, January 25, 2003.
12. Benjamin Stora, *Appelés en Guerre d’Algérie* (Paris: Gallimard, 1997) contains many personal photographs by the appelés, or draftees.
13. *Photography: A Middle-Brow Art*, trans. Shaun Whiteside, reprint, 1965 (Stanford: Stanford University Press, 1990), 5.
14. The following is based on an interview with Pierre Bourdieu conducted by Franz Schultheis, Collège de France, Paris, 26 June 2001 in Pierre Bourdieu, *Images d’Algérie*, 19, 29, 28 and passim. Translations are mine. “Observations concernant les documents photographiques de Pierre Bourdieu,” in *Images d’Algérie*, 205–13 also proved invaluable.
15. Pierre Bourdieu, *The Logic of Practice*, 3.
16. Pierre Bourdieu, “Retour sur l’expérience Algérienne,” in *Interventions, 1961–2001: Science Sociale & Action Politique*, ed. and comp. Franck Poupeau and Thierry Discepolo (Marseille: Agone for Contre-feux, 2002), 37.
17. Thérèse Rivière, photographer, Fanny Colonna, comp. and ed., *Aurès / Algérie 1935–1936. Photographies de Thérèse Rivière. (Suivi de) Elle a passé tant d’heures par Fanny Colonna* (Paris: Editions de la Maison des Sciences de l’Homme, 1987).

Heghnar Zeitlian Watenpaugh

A French Humanist in the Islamic City

The Chevalier d'Arvieux (1635-1702), Merchant and Consul in Aleppo

To explore the Islamic city: to take in the exotic smells of its bustling bazaars, to stroll down its meandering irrational alleys, to lurk in the coolness of mosques, to watch the dervishes whirl, to discover decayed remains of past civilizations, to penetrate hidden courtyards and seraglios, to plumb the depth of its debauchery, to lose oneself in the delights of wine, opium, nameless voluptuous odalisques and depraved young men, to hear the call to prayer at dawn, to go native for a while: these are the enduring tropes of accounts of western explorers to that most western of constructs, the Islamic city. Explorer-soldiers, artists, architects, intellectuals, missionaries, scholars, and spiritual seekers from Sir Richard Burton, Isabelle Eberhard and Delacroix to Pierre Loti, Gertrude Bell and Le Corbusier have reveled in their travels to the Orient, and written about the strange sites and sights of the Islamic city. The best known traveler's accounts have served as sources for the enduring myths about the Islamic city that still constitute part of the expectations of every tourist and backpacker. Preceding and permeating these accounts, however, stands a less well known tradition of proto-Orientalism in French letters in the seventeenth century.

The *Grand Siècle* was a period of renewed interest in the Mediterranean trade under Louis XIV and his minister Colbert. Louis XIV was eager to ensure France's supremacy in the lucrative trade of luxury items from the East, then dominated by the British Levant Company. In a political climate that perceived the Ottoman empire as Europe's nearest "Other," an intellectual current emphasized the study of its languages, literatures and history.¹ A century before the Enlightenment, most seventeenth-century French Orientalists, such as d'Herbelot with his encyclopedic *Bibliothèque orientale* (1697) privileged the study of the Orient from manuscript texts and scorned as inaccurate and fanciful the numerous available travelers' accounts. Many travelogues recorded visits to the same sites and rehearsed the same comments; however, a few works by diplomats and merchants, immensely popular in their own time, remain valu-

able records of the economic and social life of Islamic cities (Thévenot on the Ottoman Empire, Chardin on the Safavid Empire).

Written by men proficient in the living languages of the Middle East who had spent years abroad, these books constitute, as it were, forerunners of ethnography. The memoirs of the Chevalier d'Arvieux, published in 1735 in six volumes, recorded the knowledge and experience of a merchant who spent the period 1653 to 1692 living in various Ottoman cities as a commercial agent, and possibly as well, a spy for Louis XIV.² This time abroad was punctuated by stays at court where d'Arvieux was a valuable source of information for Ottoman and Eastern economy, diplomacy, and etiquette. He contributed to the representation of the East in French court culture notably as an advisor for the "Turkish scenes" in Molière's comedy *Le Bourgeois Gentilhomme*.³ This fascinating cultural mediator spent six years living in the one of the Mediterranean's most important centers of long-distance trade, Aleppo. This essay outlines d'Arvieux's practice of this particular city: his solemn arrival, his spatial movement, and the manner in which he viewed the local architecture. Relatively obscure today, men like d'Arvieux – clerks for commercial companies, diplomats, dragomans, younger sons of the nobility seeking antiquities – made incursions into the Ottoman empire and formulated representations of the East. Disseminated in the metropole through published books (this was after all the dawn of print-capitalism) – and other media including diplomatic dispatches and plays like Molière's, they established tropes that endure until today.

The Chevalier d'Arvieux came to Aleppo as the consul of the French "nation," representing the commercial interests of French and Dutch merchants in the Ottoman empire. As a result of treaties known as the "Capitulations," European states in the early sixteenth century obtained concessions from the Ottoman state that allowed them to trade their manufactured goods with products from the East.⁴ The Capitulations shielded European



Figure 1. Alexander Drummond (d. 1769). View of Aleppo from the West, 1746. From: Drummond, *Travels Through... Various Parts of Asia as Far as the Euphrates* (London: W. Strahan, 1754).

representatives from legal inequities to which *dhimmis* (non-Muslims) were subjected. Thus the communities of European merchants in major trading Ottoman cities functioned as small diplomatic enclaves, protecting the interests of their states as well as in representing them to the local authorities.

Laurent d'Arvieux placed his memory map of Aleppo among his memoirs. Published in 1735, edited by Father Jean-Baptiste Labat, the memoirs chronicle d'Arvieux's career as a merchant-diplomat through excerpts from his journals and letters, intercalated with transcripts of official documents.⁵ Born in Marseille to a noble but impoverished family, d'Arvieux was one of many destitute French noblemen who embraced the long-distance trade with the Levant, as this had become an acceptable occupation for aristocrats by special privilege of the king. Many sections of the journals were written like travelogues. This genre, especially chronicling travel to the Ottoman empire and pilgrimage to Jerusalem and the Christian holy sites, was immensely popular throughout Europe. Written by merchants, scholars, biologists, or antiquity hunters, these books followed established conventions for their format, fantastic-sounding

titles, and the self-presentation of the authors. Enjoyed by arm-chair travelers and early modern tourists alike, these books instructed on the acceptable ways of visiting and viewing those cities that were especially prominent in the European imagination. For example, no self-respecting traveler would wander in Istanbul without their copy of Pierre Gylli's *Topography of Constantinople*, which privileged sites from classical antiquity and Byzantine churches, above all the former church of Hagia Sophia.⁶ In Jerusalem, the Christian pilgrimage itineraries were even more tightly choreographed. Unlike Jerusalem or Constantinople, Aleppo was not a pilgrimage destination for Western visitors, rather, it was a center of trade and transit. Some of the conventions of looking at the city however, especially the prominence of all things related to Classical Antiquity, continued to be determinant.

The Chevalier d'Arvieux took his post as consul of Aleppo in 1679. This appointment by King Louis XIV was the crowning achievement of a life spent in various "échelles," or overseas trading centers of the French merchant empire, including Izmir, Sidon and Tunis. Being the leader of the Frankish "na-

tion", as the communities of foreign merchants were known then, d'Arvieux was keenly aware that he represented the French king. This is nowhere more apparent than in d'Arvieux's lengthy account of his ceremonial entrance into the city.⁷ He arrived by sea from Marseille to Alexandretta, the Mediterranean port nearest Aleppo. Pigeons were immediately sent to Aleppo carrying news of the arrival, while elegantly mounted d'Arvieux, and his entourage of one hundred men, as well as one hundred mules and unspecified numbers of servants, proceeded on the three-day journey to the city. Each night, the traveling party was hosted by the Ottoman officials of towns along the way. At a proper distance from Aleppo, he was met by Dupont, the previous consul of the French nation, a division of janissaries, as well as all the members of the French nation, their *dragomans* or local interpreters, and the consuls of other European nations, with the exception of the English—an affront that heralded a bitter rivalry. Even though d'Arvieux ordinarily dressed "à la turque" in the Levant, on this occasion he sported the richest of European costumes. A long description of his clothes and the accoutrement of his horse detail a red vest

of Dutch broadcloth adorned with ribbons from Spain and lace from France, his knight's cross suspended from his neck, and a sword with a silver handle. Besides signaling wealth and power, d'Arvieux's sartorial splendor reflected the French empire: after the current fashion, he wore a hat made of beaver or sea otter fur from Canada. Thus attired, the new consul entered the city in a tightly organized procession. The janissaries in their finest livery preceded the dragomans, the two French consuls riding side by side, consuls of other European nations, and the members of the French nation. This procession entered through the northwestern gate of Bab al-Faraj and concluded at a caravanserai in the heart of the central commercial district, the seat of all the European consulates. There a banquet followed mass at the consular chapel. This procession through the city was a highly elaborate, visible ritual that advertised to the rulers of the city, and its merchant community the important change that had taken place within the French consulate.

Just as d'Arvieux himself was a surrogate of the King, so his quarters in Aleppo were a surrogate of Versailles. There



Figure 2. Entrance to the Citadel of Aleppo. 1930's photograph. From Sauvaget, *Alep* (Paris: Genthner, 1941), Plate X.

d'Arvieux held court, receiving members of his community, of other "nations," and Ottoman officials in a style that befitted his position. The consulate was located at this time in the caravanserais known as Khan al-Hibal, in the commercial district. Urban caravanserais were two-story rectangular buildings centered around a courtyard with a single monumental entrance, combining the functions of inn and warehouse. Exceptionally, since Aleppo included so many European merchants, the "nations" set up long-term quarters altered to suit their own spatial needs, their "practice of space," including the consecration of small chapels. Thus, two modes of using the same space – that of the European consul and that of the local merchants – co-existed.⁸ The caravanserais were part of the network of miles of covered markets and commercial structures that comprised Aleppo's central economic district, one of the largest covered bazaars in the world. Its buildings were charitable endowments (*waqf*), mostly built by prominent Ottoman patrons in the sixteenth century along the Roman-era grid of the ancient town. It was an exceptional urban space, extraterritorial to the rest of the city.⁹ It was a space of uncommon openness, a place of encounter, where religious communities and diverse social strata interacted. In this openness, the central district contrasted with the customary discretion of most urban neighborhoods, with their strong social identity and often self-contained economies.

After describing his arrival, d'Arvieux's text details his diplomatic and business activities and the handling of inter-community conflicts. Spatially, he was confined to the bazaar, where he conducted business, hosted minutely described dinner parties, attended mass in the consulate chapel and patronized cabarets. The European merchants were discouraged from venturing into the rest of the city and did not often fraternize with the local society, including local Christians. His actions were strictly regulated by etiquette, and he was at all times aware of the necessity to preserve his consular dignity. However, thanks to his fluency in Arabic and Ottoman, he forged strong personal friendships with several members of Aleppo's military and legal hierarchy. While younger members of the European merchant community sought diversion in hunting parties and horseback promenades outside the city, d'Arvieux favored excursions and picnics to the orchards beyond Aleppo, and visits to the dervish lodges on the urban periphery. Apart from the central economic district and the outskirts of the town, his descriptions of the city either appear to rely on hearsay or are cursory. Even while d'Arvieux continuously lived in Aleppo for seven years, his personal knowledge of the city extended only to clearly defined sections of it. He knew little of the residential quarters, even the mostly Christian quarter of Judayda, or of the smaller commercial centers. His movement in the city was limited to the central commercial area. A dual city emerges from his writing: the fiercely private quarters, and the extremely open commercial strip.

However, he appended a list of every neighborhood in the city and the suburbs, with the number of its households, as well as a list numbering each type of public institution: mosques, palaces, caravanserais, public bakeries, mills, tanneries, churches,

etc. The lists evince an anxious attempt to catalogue, according to a set of rational categories, a city that remained elusive. However, these institutions are not named or described. D'Arvieux described only two mosques at any length, the Bahramiyya and the 'Adiliyya. Both were built in the sixteenth century in prominent locations on the axis of the commercial district, and not coincidentally, the endowments of both mosques included substantial commercial institutions. By contrast, d'Arvieux says nothing of the two oldest and most important religious sites of Aleppo, the Great Mosque and the Madrasa Hallawiyya, both closer to his consulate. The only building to which he devotes a long description is the citadel, which he calls a "château."

Located on a high mound at the center of the city, the citadel and the high minaret of its mosque are visible from everywhere. A seventeenth-century visitor would have viewed the exterior of the citadel largely shaped during its last major renovation by al-Zahir Ghazi, a son of Saladin and the ruler of Aleppo, in the early thirteenth century, advertised by prominent inscriptions and emblems. While recent excavations of the site have revealed that the site of the citadel has been occupied since most ancient periods of human history, in d'Arvieux's time these layers were invisible and unknown. Nevertheless, d'Arvieux concludes that the citadel was an old "Frankish fortress," built not by the Crusaders, but at a much more ancient period. This conclusion reveals d'Arvieux's way of seeing and understanding the architecture of the Levant by trying to discern vestiges of Antiquity. This way of seeing obtains in all his descriptions of Ottoman cities; indeed, he sometimes saw himself as an amateur archaeologist.¹⁰ As Laurens has pointed out, the French proto-Orientalists of the seventeenth century viewed the Orient through the prism of the Classics. For d'Arvieux, Aleppo's citadel dated to this classical past, the decayed remnants of which he saw littering the landscape of the modern Ottoman Empire. His discussion of the history of the city is limited to the Biblical and Classical periods as well: several pages are dedicated to the demonstration that the city called Berea in early Christian treatises is one and the same as the modern city of Aleppo. His references for the history of the city are drawn from Classical Antiquity and Christian sources. Surprisingly, though his linguistic skills gave him access to them, d'Arvieux never used Arabic or Ottoman sources on Aleppo's history; he only used these languages to apprehend the city's present, to understand intricacies of commerce and law.

About the city's present, however, d'Arvieux was exceptionally well-informed. "Whatever Aleppo once was, it is today a city of great commerce. ... one sees there nations from all the sections of the ... World."¹¹ D'Arvieux presented an accurate picture of a particular section of the human landscape of Aleppo: the European merchant community; and in hierarchical order, the local military, customs and judicial officials, including the amounts of their salaries, the lengths of periods of office, and their areas of jurisdiction. His discussion of the local minority communities, the Eastern Christians and Jews, many of whom worked as merchants, dragomans and intermediaries, is fairly accurate in

terms of sectarian distinctions, yet viciously unflattering. Despite this, d'Arvieux stated: "What is good and extraordinary, and what distinguishes advantageously these people [Aleppines] from those of the Ottoman Empire, is that they are the most gentle, the least malevolent and the most accommodating of all of this vast empire."¹² Beyond the population, the natural landscape stunned d'Arvieux by its fecundity, moving him to devote several pages to the wondrous abundance and variety of fresh fruits and vegetables easily and cheaply available. Yet the natural landscape of the Ottoman city, while fecund, was without order or rationality: "... gardens ... in truth are not planted nor cultivated in our manner, because the trees do not form alleys as they do among us, but [here] they are in confusion and without order."¹³ D'Arvieux's text presents a particular vision of the city of Aleppo, rooted in his own culturally constructed ways of seeing. Other writers, who drew on traditions of narrating the city in other languages and viewpoints, focused on different aspects of the city.¹⁴

D'Arvieux's text wavers between the expression of his empathy for a place and its community, and the assertion of fundamental flaws, especially when contrasted to normative Europe. Praise for the fairness and expeditiveness of Islamic law is immediately followed by the contention of widespread corruption.¹⁵ D'Arvieux's text also wavers between the staging of the exotic and the provision of accurate information and heartfelt insight about a region critical to the European economy. Michèle Longino interpreted this period's travelogues into exotic realms as a gesture of conquest.¹⁶ This notwithstanding, texts such as d'Arvieux's constitute an opportunity to historicize Orientalism, and probe into the project of the production of knowledge about the Orient.

D'Arvieux's text can be situated within a proto-Orientalism that foreshadows the full-blown Orientalism of the eighteenth and nineteenth centuries. Henry Laurens has argued that the collective project of creating knowledge about the Orient in the seventeenth century constituted a secondary humanism. Rather than examining Classical Antiquity, which was distant chronologically, it examined regions that were distant geographically.¹⁷ Seventeenth-century humanists applied to the study of the Orient methods used in their study of Antiquity. In the humanistic encounter, the Orient was – almost – the equal of Europe. By contrast, in the nineteenth century, the Orient's difference was more emphatically hierarchical, with Europe as the dominant partner. In addition, the seventeenth-century saw the Orient through the prism of the Orient's own, now-decayed Classical past, a past it shared with Europe. In the historiography of space, particularly in the study of Islamic cities, this classical prism in the study of Levantine cities is perhaps one of the most important legacies of the early Orientalism of the *Grand Siècle*. Jean Sauvaget, the influential twentieth-century scholar of Islamic urbanism, created a framework for the study of Muslim cities along the Mediterranean littoral that centered on a narrative of irreversible decline from the rational grid plan of classical antiquity to the slow degeneration into irrational diagonals,

meandering alleys and culs-de-sac of the Muslim present.¹⁸ From d'Arvieux's proto-Orientalism to Sauvaget's scientific *arabisation*, exploration into the Islamic city entailed grappling with the vexing complexities of space and difference.

Notes

1. Henry Laurens, *Aux sources de l'orientalisme: La Bibliothèque orientale de Barthélemy d'Herbelot* (Paris: Maisonneuve et Larose, 1978), and his *Les origines intellectuelles de l'expédition d'Égypte. L'orientalisme islamisant en France (1698-1798)* (Istanbul: Isis, 1987).
2. Laurent d'Arvieux (1635-1702), *Mémoires du Chevalier d'Arvieux*, edited by Jean-Baptist Labat (Paris: C.J.8. Delespine, 1735), 6 vols.
3. J. Hossain, "The chevalier d'Arvieux and Le Bourgeois Gentilhomme," *Seventeenth-Century French Studies* 12 (1990): 76-88.
4. Bruce Masters, *The Origins of Western Economic Dominance in the Middle East: Mercantilism and the Islamic Economy in Aleppo, 1600-1750* (New York: New York University Press, 1988).
5. Mary Hossain, "The Authenticity of the 'Mémoires' of the Chevalier d'Arvieux," *Arab Historical Review for Ottoman Studies* 7-8 (1993): 71-101.
6. Jean Ebersolt, *Constantinople Byzantine et les voyageurs du Levant* (Paris: Leroux, 1918).
7. "Journal du Voyage à Alep," in d'Arvieux, *Mémoires*, vol. 5.
8. Jean-Claude David, and Thierry Grandin, "L'habitat permanent des grands commerçants dans les khans d'Alep à l'époque ottomane," in *Les villes dans l'empire ottoman: activités et sociétés*, ed. Daniel Panzac (Paris: CNRS, 1994), vol. 2, 84-124. Jean-Claude David, "Le consulat de France à Alep sous Louis XIV. Témoins architecturaux, descriptions des consuls et des voyageurs," *Res Orientales* 8 (1996): 13-24.
9. On the urban history of Aleppo, see Jean Sauvaget, *Alep: Essai sur le développement d'une grande ville syrienne, des origines au milieu du XIX^e siècle*, 2 vols. (Paris: Geuthner, 1941); H. Z. Watenpaugh, *The Image of an Ottoman City: Imperial Architecture and Urban Practice in Aleppo in the Sixteenth and Seventeenth Centuries* (Leiden: Brill, forthcoming).
10. Mary Hossain, "Smyrna 1653 to 1658 as Seen Through the Eyes of the Chevalier d'Arvieux," *Res Orientales* 8 (1996): 33-43.
11. D'Arvieux, *Mémoires*, vol. 6, 418.
12. D'Arvieux, *Mémoires*, vol. 6, 414-415.
13. D'Arvieux, *Mémoires*, vol. 6, 412-414.
14. For a discussion of Arabic and Ottoman language texts and images of Aleppo, see my *Ottoman City*, Chpt. 6. I analyze narratives of the city by foreign and minority groups in, "The Non-Muslims' Islamic City: a French Consul, a Jewish Merchant and an Armenian Pilgrim Narrate Ottoman Aleppo," in preparation.
15. D'Arvieux, *Mémoires*, vol. 6, 447.
16. Michèle Longino, "Imagining the Turk in Seventeenth-century France: Grelot's Version," and her *Orientalism in French Classical Drama* (Cambridge: Cambridge University Press, 2002).
17. Laurens, *Aux sources de l'orientalisme*, 91.
18. André Raymond, "Islamic City, Arab City: Oriental Myths and Recent Views," *British Journal of Middle Eastern Studies* 21 (1994): 3-18.

Bradley McGilvary Pitts

Humane Exploration of Space

As former astronaut Dr. Jeff Hoffman has stated that exploration is “everything that expands the realm of human experience and of human consciousness.” Exploration is about expanding our awareness of existence on all its levels. Thus, explorations can focus on those things that are exterior or interior to our own bodies. As many yogis, meditators, or philosophers attest, there is plenty to explore internally without ever leaving the confines of a room. Indeed, as the body is the primary sensor or receiver, even physical explorations requiring travel to the Moon are simply new conditions in which to explore inwardly. By paying attention to the internal reactions to external stimuli we come to know both the universe and ourselves.

Many have argued that space exploration is validated by technology spin-offs, but this is misleading. Yes, the goal of space exploration (manned and unmanned) has brought about technologies that were unavailable before, but that is what any pursuit is about: the ability to think/create/do in ways that were never before possible.

I would like to suggest that one will never find the motivation for space exploration in a logical way. Space endeavors are not about the highly mechanistic gears of logic and reason, although much logic and reason is needed to carry them out. Space endeavors are about the opposite: the elements that make us human, above and beyond the molecular billiards of science. As described below, they are truly an act of Humane Factors Engineering.

Human Exploration of Space

The question and answer session of any public lecture given by an astronaut usually begins by a small hand being raised. The young individual, routed on by a parent or two, timidly asks, “What’s it like in space?” Although there is plenty of literature to be read on the environment of space including information on temperatures, light conditions, pressures, etc., it is clear that none of these quantifications can ever answer the question.

What the public seeks is an experience that they can slip into, so that they too can experience the wonders of alien realities.

Connecting to a larger human culture is the ultimate responsibility, the entire purpose, of any exploratory mission. Currently the primary culture that the space programs address is the scientific community. It is their experiments and data that are transported back and forth between orbit and the labs on the ground. They are the ones privy to the information and its interpretation. They are the ones intensely interested in the results.

Space exploration must focus more attention to connecting with human culture on the broadest scale. The current situation seeks measurements, leaving human experience as a residual concern. Although humans cannot travel without bringing their humanity, this should not merely be an added benefit. Technically trained astronauts do an inspiring job of relating their human experiences. However, this is clearly not what they have dedicated their lives too. The paradigm of science and technology is not one of human expression, but one of measurement, quantification, and “objectivity.” These fields try in many ways to remove humanity from the discussion. In order to truly explore the human experience of space, we must allow and encourage astronauts to explore the full extent of their humanity while in orbit. Although many argue the benefits of human exploration by talking about human physical capabilities, this justification misses the point. Humans are not simply manipulators capable of extreme dexterity, nor are they merely advanced computers capable of amazing feats of real-time flexibility. They are *human*, a distinction that brings spiritual and emotional capabilities such as empathy and identification.

As Oskar Schlemmer stated, “a further emblem of our time is mechanization, the inexorable process which now lays claim to every sphere of life and art. Everything which can be mechanized is mechanized. The result: our recognition of that which cannot be mechanized.”¹ Thus, the rationale for humans in

space is not their physical dimensions or capabilities, but their humanity, their culture, their spirit.

Humane Factors Engineering

Some would argue that science and engineering take culture and humanity into account through such disciplines as Human Factors Engineering. A look at the history, utility, and paradigms of this field, however, shows that within this discipline humans are abstracted into cogs in a machine via quantification and equations. Applied science is concerned with creating machines and humans are considered only within that context. As an alternative, I propose a new notion: Humane Factors. Although Humane Factors is capable of considering such mechanical concerns as ergonomics, it also reaches beyond to philosophy and intuition. It is capable of doing this because it does not rely on quantification or an objective reality; rather, it is a branch of artistic inquiry.

Humane Factors will consider all avenues of thought and experience. It will be a playful endeavor and as such would allow those involved, both designers and users, to be truly free and genuine humans. In order to have meaningful results space exploration must be pursued with constant connection to the original inspirations and beliefs from which it was born. It must consider the human in ways not typically considered in engineering or science. Although disciplines like human factors engineering clearly holds a pivotal role, it is time to evolve into a broader vision capable of inhabiting the divide between reason and spirit: Humane Factors Engineering.

In the early Soviet space program, piloted vehicles were first designed as autonomous spacecraft and only later retrofitted

for cosmonauts. As historian Slava Gerovitch has pointed out, "Soviet spacecraft designers clearly assigned the manual control system a secondary role, and they probably did not seriously believe that it would ever be used." In fact, Gerovitch goes so far as to say, "Soviet cosmonauts were asked not to interfere with the automatics." This is in contrast to American astronauts who fought hard to maintain their pilot status while inside spacecraft.²

On Aleksei Leonov's first flight he carried with him an invention that no machine would have: a colored pencil bracelet, and a sketch pad. With these tools he sketched the horizon of the earth as seen from space, a truly humane manifestation of space exploration. (Figure 1)

Space Make-up

In the 1980's and '90s, women astronauts had the option to carry with them a space make-up kit. (Figure 2) The kit contained all that was necessary to transform a disheveled astronaut into a well-kept Houstonian. Rationalized as a required amenity for video conferences and public appearances, kits like this flew on many missions. The kit is shocking if space exploration is viewed as an extreme expedition like the attempts to get to the North or South Pole. Weight and space are so precious in space that a frivolous item like this is rarely allowed. After all there are certain amenities one must do without when inhabiting extreme conditions. Thoughts like these frame the make-up kit as frivolous, irrational, and ridiculous.

Initially horrified to discover its existence, I grew to admire it for its humor and tenderness amidst the stoic technopoly of aerospace engineering. It stands as a keyhole through which art



Figure 1

has already entered the weightless realm. With time the idea grew on me as I saw it in a new light. It was not a frivolous invader into the pristine, rational realm of rocket science, it embodied one reason why we were there. When traveling in a vacuum there is little opportunity to pull resources from the environment and thus one must seriously consider what can and should be brought along. Items of sustenance and survival are the first considered: air, water, and food. Systems designed to mesh with natural body functions are designed and built so that hardware and body can exist in symbiotic relationships. As the body becomes mechanized through its dependence on the hardware, the machine becomes humanized.

Space exploration is the ultimate exercise of self definition through choice. Just as the spacesuit asks what body we want to bring, space exploration asks what we are willing to work towards. Our answers reflect our definitions of ourselves and our beliefs on a societal and world scale.

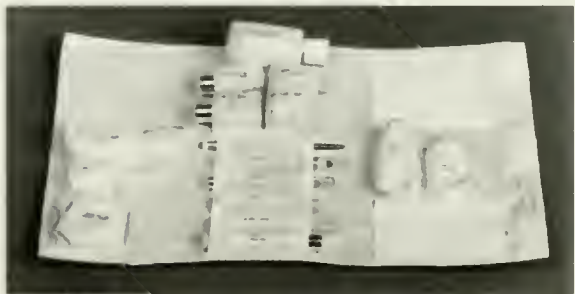
The biggest question, though, is why are we in space? Is our goal to simply sustain life in space, encapsulated and isolated from the extreme environment? Is survival the ultimate goal or is there more?

All space hardware contains human aspects, and rightly so. Looking at the Saturn V rocket that took us to the Moon, it is incredible, in fact ridiculous, to realize that despite its tremendous size and complexity, only the uppermost cone of the stack contains the inspiration and the quest: human passengers. (Figure 3) All the technology of transportation and life support in space exploration is truly secondary to the ultimate mission goals; they exist as facilitators. There is immense human ingenuity behind these devices, but their purpose is to allow humans - humanity intact - to explore, to play, in a new environment so that they can return to their own with new eyes. The history of technological development behind each screw and connection is a fascinating story of challenges encountered and surpassed. There are rationalized, quantified benefits of science and technology development, but there is more: life. Many space activities highlight the humanity of the astronants, but there are few manifestations of humanity that are supplied by space administrations. In moments of relaxation, astronauts play with their food, tumble in weightlessness, or even swing dance. All these activities involve an open exploration of weightlessness possible only in play. Unfortunately these playful activities are rarely celebrated in public and are viewed as cute side notes to the otherwise serious mission goals, rather than being relished for what they are: humanity, culture, and art. Whether conscious or not, it is impossible to send a human without sending humanity as evidenced by the space make-up kit.

The space make-up kit represents an acknowledged humanity in space. As such it steps beyond human factors into Humane Factors. It is an art kit supplied for the sole purpose of human

expression. It does not suggest a goal or objective, but merely exists as a opportunity for expression. Unlike most of the activities that astronauts perform, using the space make-up kit is not programed by a sequence of operations or tasks. It exists as an opportunity for pure human creativity: the ultimate potential of human existence.

The universe, matter, energy, and all things unknown exist with or without our discovery of them. They go on functioning and changing as their interactions dictate. Our interest in deriving theories from our observations is not for the universe's benefit, but for ours. Our machines are not important because they add new capability to the universe. They are important because of the ways they interact with humans, with humanity, with culture.



MAKE-UP			
Part No.			
528-20357	-1	Clinique Creamy Blush	
	-2	Clinique Blush Compact Assy	
528-20728	-21	Clinique Skin Texture Lotion	
528-43067	-1	Clinique Mild Facial Soap	
	-2	Clinique Hand Repair	
	-3	Clinique Touch Liner	
	-6	Clinique Lipgloss	
	-7	Clinique Eye Shadow (Violet)	
	-8	Clinique Eye Shadow (Quartz)	
	-9	Clinique Swimmer's Mascara	
	-10	Clinique Eye Shading Pencil	
	-11	Clinique Eye Pencil Sharpener	
	-12	Clinique Moisturizing Lotion	
	-13	Clinique Make-Up Base	
	-14	Clinique Stay True MakeUp Base	
	-16	Clinique Plum Brandy Lipgloss	
	-17	Clinique Mascara, Swimmer's (BLK)	
	-18	Clinique Eye Shading Pencil (BLK)	
528-20728	-22	Clinique Skin Texture Lotion	
528-43025	-1	Skin Emollient, Aloe Vera Gel	

Description.	Development Lineage:	
• Crew preference makeup items	Modified Off the Shelf products	
Weight:	Varies	Vendor
Volume:	Varies	See Above
Type:	Consumable	
Restraint	Stowed when not in use	
Stowage	Standard Stowage Trays	

Figure 2

Scientific and artistic explorations both explore and probe the nature of reality. Physical explorations such as those to the Moon or on the far corners of the Earth usually involve experiments of some kind. These experiments probe the alien reality, bringing a new internal understanding to the human explorer. These measurements become a language through which a new reality can be communicated, once again altering the internal aspects of the receivers. Scientific discourse considers the mechanical, material, and energy aspects of our existence, but we all know from experience that there is more. That "more" is culture. The "culture of science," or any other field, describes the human activities and interaction that take place within that field. Thus, the *culture* of science is precisely the *humanity* of science. It is exactly this humanity which is at the heart of art; it is exactly this humanity which is at the center of Humane Factors.

Notes

1. Walter Gropius and Arthur Wensinger, *The Theater of the Bauhaus* (Baltimore: John Hopkins University Press, 1961).
2. Slava Gerovitch, *From Newspeak to Cyberspeak: A History of Russian Cybernetics* (Cambridge, Mass: MIT Press, 2002).



Figure 3

Peter Galison and Jennifer Ferng

Nanobiochemiophysics: A Conversation with Peter Galison

Peter Galison is the Mallinckrodt Professor of the History of Science and of Physics at Harvard University. His main work explores the interaction between the principal subcultures of twentieth-century physics, experimentation, instrumentation, and theory: *How Experiments End* (1987), *Image and Logic* (1997), and *Einstein's Clocks, Poincaré's Maps* (2003). With Lorraine Daston, he is now completing a study of the history of objectivity, *Images of Objectivity*. Several of his projects examine cross-currents between science and other fields—most recently, his co-edited volumes on the relations between science, art, architecture, and authorship: *The Architecture of Science* (1999), *Picturing Science, Producing Art* (1998), and *Scientific Authorship* (2003). In 1997, he was named a John D. and Catherine T. MacArthur Foundation Fellow, and in 1999 he received the Max Planck Prize.

Jennifer Ferng (jf): In this issue of *Thresholds*, we are looking at the redefinition of exploration, what it means when we call something a “frontier,” and what now defines the new boundaries between disciplines and subjects of discovery. What are the new types of frontiers—including nanotechnology—that are being explored or reinvented in science? Is smaller the new frontier? How do you see these trends relating to other fields such as art, architecture, and engineering?

Peter Galison (pg): “Frontiers” in science designate different things. Certainly, scale matters. There is a frontier at the very small. For instance, string theorists are now considering aspects of the world many magnitudes smaller than had been considered even by the particle physicists of a few years ago. Intriguingly, nanoscience is not the frontier of the smallest—instead, it focuses on objects that are *big* in scale compared to particle physics, atomic physics, nuclear physics, or string theory, and yet small when compared with human-sized (much less astronomically big) objects. (The “nano” of nanoscience or nanotechnology refers to a billionth of a meter; string theory is concerned with objects a million billion billion times smaller.) Wedged between the micro and the macro, the nanoworld also

conceives itself as a frontier in another sense—it picks out the mesoscopic domain, the physics (or biology or technology) of tens, hundreds or thousands of atoms. This is important for several reasons. First, the mesoscopic is a size of shared concern to engineering, physics, biology, and chemistry. For example, a billionth of a meter is the scale of viruses, those natural syringes that inject their DNA into cells. So right away, this gets biologists’ attention. But biologists are interested not only in viruses, they are also pursuing a myriad of the smallest-scale mechanisms, devices (natural or constructed) that can propel an object, construct an entity, or sort various bits of genetic material. Or they might want to find their own ways of injecting fluids into individual cells—to reach cancer cells, for example, without touching normal cells. For the engineer, however, the nanoscale is also the size at which the smallest imaginable electronics would occur. Over the last decades, computer scientists have gotten us all used to doubling computer capabilities every two years, but this relentless, economy-driving shrinkage is clearly reaching its limit both physically and fiscally. Nanoscience offers the tantalizing hope of relief from this limit by offering the possibility of constructing transistors and circuits that would be built of no more than a few atoms. Consequently, electrical engineers have joined the biologists in focusing on nanotubes and other mechanisms at this scale, while material scientists see the new molecules as tools for strengthening composite materials. And physicists are tantalized because the nanoscale is the boundary point where things behave partly like quantum systems and partly like classical physics. So in answer to your question: yes, there is a frontier of the small, but nanoscience is not the frontier of the *smallest*. Instead, it is viewed as a frontier that is more of a crossing point (or trading zone), a peculiar and peculiarly intriguing frontier that does not fit into the better-known march towards the ever tinier. It is this property that intrigues me most: the nanosciences form a crowd of disciplines, each with its own agenda *and* yet sharing ambitions that no single discipline can claim. In this sense, the nano-frontier is different from what we have known before.

jf: Some of the scientists within nanotechnology are working with the issue of materiality, tweaking objects at the nanoscale so that materials can outperform themselves in terms of conduction, tension, elasticity, and insulation. Architects are always interested in how materials are able to improve the lasting quality of design; do you see this trend as having larger implications for the relationship between architecture and nanotechnology?

pg: Engineers who come to the nanodomain are indeed interested in things like strength of materials, and much has been made in the popular press of imaginative ways one might deploy very thin fibers with extraordinary tensile strength. More proximately, new molecules will certainly be used in more prosaic ways, improving tennis rackets, car bumpers, sunscreens, or airframes. Technoenthusiasts (or shall we call them visionaries or propagandists) and science-fiction writers imagine elevators hoisting and lowering objects along fibers that extend from earth to space. Even in much simpler (and more practical) applications, it is clear that nanotechnologies will shape the design of new materials that will find application in architecture. It may be that in the future architecture is less altered by such nanocords than they are by "smart materials," optically and thermally variable surfaces; or perhaps architecture will be more directly shaped by new kinds of computation.

But perhaps the most interesting philosophical lesson of all this nanotechnology is that surfaces are not, as we often depict them (Deleuze, Foucault), pure, mathematically-thin membranes that enclose spaces. Surfaces are active and highly structured. Surfaces do not produce depth by surrounding volumes, surfaces have their own kind of depth and it is this depth and complexity that lets them seize and sort molecules, embed circuitry, alter optica, or become biologically active.

jf: This perhaps leads into the next question. Nanotechnology is sometimes associated with a particular type of paranoia or fear; I recently read that DuPont is investigating how there are

potentially hazardous environmental and health risks associated with using some of these inventions. They have not foreseen the extent of the possibilities yet but know that the hazards are still there. Is there a legitimate paranoia attached to this field?

pg: There seems to be, very crudely, two classes of worries you could have about the nanosciences. The most paranoid science-fiction fantasy about nanotechnology is that tiny nanobots might assemble themselves into a huge and malign intelligence; this has become a staple of dystopic fiction and popular science. But environmental organizations like Greenpeace, are not mainly worried about these Drexlerian fantasies about the world being taken over by out-of-control, swarming nanobots. They are very concerned about fabrication issues of the type all too familiar from soil and ground water pollution associated with manufacturing microelectronics. Electronics look quintessentially clean when they are neatly packed in styrofoam boxes, but chip making, here and abroad, is a dirty business. In twenty years, nanotechnology may be more of a concern to people fighting toxic sludge than to those braced in terror against new forms of distributed intelligence. However, when one assesses future risk, it is important both analytically and politically to separate issues of function from issues of fabrication.

jf: How then does nanotechnology compare to more historical frontiers such as space exploration?

pg: The principal difference between space exploration and nanotechnological exploration is that space exploration has always been, almost in its entirety, a governmental monopoly despite private communications satellites and some smallish efforts to privatize manned space flight. It is essentially and overwhelmingly governments that have used space for the delivery of weapons and satellites—alongside the dramatic lunar, planetary, and telescopic probes. Because these state-controlled enterprises are such high-risk and expensive endeavors, they have a different dynamic from the ventures

of the private sector. NASA may use Silicon Valley, but the myriad companies of Silicon Valley don't have anything like the centralized structure of NASA. Nanotechnology is, for the moment, vastly more dispersed than "classical" chip making. This is not to say that there isn't some strong government sponsorship of nanosciences: think of MIT's military-funded Institute for Soldier Nanotechnology. That institute aims to develop, *inter alia*—among other things, smart uniforms that would detect, diagnose, and perhaps heal wounds suffered in battle, could custom-alter camouflage, or detect and respond to chemical or biological agents. At the current state of the field, though, nanotechnological laboratories are not big science, and they are springing up like mushrooms—small ones—all over the world. Indeed there is a certain, perhaps overblown, race for laboratory dominance between the U.S., Europe, and Asia as money cascades in from an amalgam of venture capitalists, multi-national corporations, and national governments. For the moment, this very diversity (in laboratory size, emphasis, and funding) gives nanotechnological and space research very different characters.

jf: Can we pursue this idea that science is driven by a combination of governmental and private interests? How do you conceptualize the present role of the public and private spheres, as well as that of the institution (for example, the university) in the making of science? What cultural shifts are associated with these different kinds of laboratories?

pg: During the whole of the long war of 1939-1989 (World War II plus the Cold War), American universities underwent a fundamental alteration. Government-funded, university-executed scientific contracts spread like wildfire during the Second World War, an arrangement that continues to the present. This is not to say that this configuration arose without tension. At Berkeley, in the early 1950s, there was a massive amount of classified research being carried out at what came to be known as the Lawrence Berkeley Laboratory, right above the campus, and by the mid-1950s at Lawrence Livermore Laboratory. For

many years there were physics Ph.D. dissertations that could not be read by uncleared members of the physics faculty. After fractious protests and struggles of 1960s, the armed guards and classified-locked research moved fully to Livermore. In the early twenty-first century, I think what we're going to see is not so much a revival of the classified research issue (though we might) but two newer axes of tension. Here is one. The anti-terrorist Patriot Act (*inter alia*) forbids access to several key kinds of laboratories by nationals of several countries. Since this is in direct conflict with stated university policies about openness of laboratories to all (regardless of race, creed, and national origin), something has to give. Here is a second: There are fundamental questions now on the table at universities here and abroad about how commercial and university research will work out their respective rules of conduct. Will student research be held from publication for proprietary reasons—for example, to allow a sponsoring corporation to make patent applications or set development programs in train? Both access and openness are big issues that will, in one form or another, be faced by every research campus in the coming years.

jf: Let's take a step backward to look at the context of your previous work. How do you position nanotechnology in light of your other books such as *Einstein's Clocks*, *Poincaré's Maps* and the three elements of experimentation, instrumentation, and theory that appear in your work on physics?

pg: One of my strongest and longstanding interests is understanding the way different scientific subcultures interact. In other words, to treat science not as a homogeneous entity with universally shared methods and tools, but to see even a single domain of science (physics) as composed of different subcultures. Instrument makers, experimenters, theorists—each group has its own characteristic ways of working and demonstrating things. The first step is to disentangle these subcultures: instrument makers, for example, are far more attached to engineers than theorists; string theorists have been building more alliances with mathematicians than they have with

other physics theorists. But once separated, a second question arises: how do these subcultures meet one another? What happens at the boundaries between them? How do instrument makers talk to experimenters or experimenters to theorists? I am interested in the ways that intermediate languages grow up between them—scientific jargons, pidgins, creoles. Biochemistry, for example, began as nothing more than a handful of shared terms and techniques. It grew, eventually, into a language sufficiently rich that one can “grow up” in it, the definition of a creole. Biochemistry is now a field with a language as rich as that of either of its parent disciplines, biology or chemistry. Just now—in the nanosciences—physicists, chemists, biologists, and engineers are precisely grappling with the problem of developing a shared language in which they can work. This relates directly to the central methodological problem of *Einstein’s Clocks*, *Poincaré’s Maps*, but in a different sphere. I wanted to see how Einstein and Poincaré were involved in work that set them at the intersection between work on the nature of time (in philosophy) on coordinated clocks (in mapping and train scheduling) and on the nature of the ether and electrodynamics (in physics). Much of my work comes back at this same difficulty from different perspectives: how do different structures of reasoning and acting coordinate at the boundary?

jf: You are able to assign abstract concepts to concrete objects such as trains and telegraphs.

pg: The question is how we can systematically understand how these different ways of thinking and working make contact with one another. In the recent work about nanotechnology, the problem, in some ways, is even more attenuated. You have engineers, physicists, chemists, and biologists all trying to figure out how to speak to one another about some of the most basic objects that they handle. An example: nanotubes, rolled up sheets of carbon atoms, are objects that are used by all four of these groups. But how does the surface chemist consult with the theoretical condensed matter physicist? Where the chemist sees the nanotube as a synthetic molecule, the physicist may see it as a transistor. How do they calculate together; how do they build things as a team? How do they understand what the others have done? What I want is both to recognize the partial autonomy of each these different scientific ways of seeing and manipulating things and, at the same time, to make sense of the trading zones that their assemblies produce.

jf: How do you see nanotechnology in relation to its parent disciplines? Is it more complex or less complex in terms of certain designated interactions between experimenters and theorists?

pg: Noam Chomsky taught us a long time ago the futility of ranking languages in terms of complexity; my instinct is that the combination of languages (pidgins, creoles) are also not more or less complex in one domain than another. For instance, think of the development of simulations in the 1950s and 60s, where you had mathematicians, electrical engineers, physicists,

weapon designers all collaborating (or trying to collaborate) in the creation of a new set of techniques, computers, procedures, and new ways of understanding what they had done. What were these simulations? Were they experiments, theory, or some *tertium quid*, a third thing not quite like either? Compare that to the biology, chemistry, physics, and engineering that intersect in nanotechnology. I wouldn’t say that one is more complex than another, but the problems that they have in their trading zones will surely have different structures. In both cases, I am interested in understanding the ways in which language and practice develop in the intersection: What comes from where? What stabilizes a way of working?

jf: What is the current state of your research right now in terms of nanotechnology? You had previously mentioned nanotubes as a pivotal object. Could you expand on what other concepts and techniques that interest you?

pg: I am interested in different orders of hybridity that must be understood in the development of nanotechnology. The first order of hybridity involves architecture very directly, and it reflects and effects disciplinary mixing. Clean rooms, fabrication facilities, visualization facilities: these are all put into spaces sited literally and figuratively between the parent disciplines. It means that graduate students in the different fields are rubbing shoulders all the way through their laboratory work. Here at Harvard, you see this first-order hybridity with the building of the new LISE laboratory (Laboratory for Interface Science and Engineering) which is geographically and administratively sited between the departments of physics, biology, chemistry, and engineering. Similar structures are going up all over the country. A second order of hybridity involves the relationship of the way we want to visualize and manipulate these nano-objects. Building-making devices—is part of this laboratory life, in ways much more familiar to engineers than to physicists or biologists trained in the “purer” scientific arts. But the discipline mixing is changing all this: fabrication (visualization and simultaneous manipulation) is a very large part of the nanosciences. This involves a fundamentally epistemic mixing, one that breaks down the classical philosophical divisions between what Ian Hacking has called two *separate* kinds of scientific work: “representing” and “intervening.” The contemplative and active sides of scientific work lose their distinctness.

jf: How do you define passive and active?

pg: You might think of passive scientific visualization as visualization that does not play a fundamental role in the process itself. If I take a picture of a bubble chamber event, I am under no illusion that the photograph or the process of taking the photograph affects the interaction of the particles. But if (as in nanoscience) you use an atomic force microscope (or one of its close relatives) to visualize the surface of a substance, that same microscope is exerting force on individual atoms on the surface under observation. In fact, the often-reproduced picture of atoms spelling out “IBM” was done with one of these

atomic microscopes. (Figure 1) Here looking and making are much more mixed, much more like telerobotic manipulation in microsurgery where the system is designed not just to peer into a distant body, but to alter it. So the old division between the Cartesians and the Baconians, the passive and the active, the spectator and the participant, those sorts of divisions that have marked epistemology for so long, may turn out to be much less useful in this second-order hybridity.

jf: In terms of some of your insight in *Image and Logic*, you note that architectural space affects the mode of scientific production. Yet, I am not completely sure that laboratories from different disciplines directly adjacent to each other generate given interactions among varied scientists. Beyond adjacencies, could other configurations of space-making impact science in a direct fashion?

pg: I am intrigued by several different levels at which space-making and scientific work coalesce. One is indeed, the prosaic fact of adjacency—what goes with what, both in the urban planning of campus design, but more specifically within the laboratory itself. The visualization and the fabrication facilities in nanotechnology are built together; you wouldn't consider having them in separate buildings, and the fact of their propinquity makes a difference to the character of the science. Beyond physical adjacency is the mode of interaction. I want to get at the ways in which the sharing of techniques, the joint use of equipment, the borrowing of ways of reasoning lead to the creation of new sublanguages (pidgins and creoles) that develop within the trading zones between fields. But in the cultural encounter between fields of science and engineering there are inevitably questions about the *kind* of space that is be made into laboratories. Is this structure to be modeled on a church? A Victorian mansion? An industrial factory? A corporate headquarters? Such choices matter—when the post-World War II generation of scientists came back from their work with engineers at Los Alamos and elsewhere, they chose to build new laboratories in ways utterly at odds with the thick-walled, distinctive campus buildings of the 1930s. Instead, they chose high bays with traveling cranes, moveable walls, modular construction, and exposed support systems. Coming of age in such sites—working in such sites day in, day out—*did* condition the persona of the scientist. Such choices matter to the scale of science of course, but it matters too to the model of who one is, how it is to live a life of science. The 1990s biologist meeting the venture capitalist in the well-appointed, carpeted, backlit reception area of the laboratory is not the physicist working in the industrial nuclear physics facility of 1950.

jf: In terms of your contributions to the history of science, what would you consider your most important or personally meaningful work?

pg: What has marked my work from the beginning is a concern to bring together the very abstract and the very concrete. In *How Experiments End* (1987), I was interested in shifting attention

away from purely theoretical questions, away from the idea that the experiment was the hand servant of theory, and toward experimenters with their own standards of demonstration, their own sense of what it meant to show something to exist. In *Image and Logic* (1997), my aim was to take that idea further, to get at the material culture of science as it was worked out by instrument makers, a subculture of physics distinct from and even more tied to materiality than the experimenters. And in *Einstein's Clocks, Poincaré's Maps* and more recent work I've been working on the opposite end of the spectrum: studying the physicists most removed from soldering irons and circuit boards—the relativists, quantum field theorists, and string theorists. And while I have always worked towards understanding the nature of the interaction between these various subcultures of science—and between these subcultures and the wider world—I've resisted those Molière-like moves that pretend to solve the problem of how fields get coordinated by invoking their "interdisciplinarity," "symbiosis," or "co-production."

jf: To close the discussion, in the *New York Times Magazine*, there is always a column entitled *Domiciles* that looks at people's living spaces and their respective possessions. To characterize Peter Galison as the individual and the historian, are there a few objects in your home or office that sum up your identity?

pg: A newfangled light, a old-fashioned desk, an evocative watercolor. I have a reading light called a LightWedge—it is just a sheet of Lucite with a light emitting diode sealed along its edge. You put it on the book that you are reading, and it illuminates only that page, leaving the rest of the room in darkness. For various uninteresting reasons, I'm up for a big portion of every night so I can read, disengaged from the world, in a quiet bubble of illumination. Then there's my big old wooden desk, chipped and stained. I love sitting at it, staring into space, writing, thinking. My jazz-musician brother William bought it for me decades ago when we were both in school; I think he paid five bucks at a Goodwill shop and ever since I've done all my work on it. I keep hoping it will absorb ideas along with all that spilled coffee. What else? On the wall at home, there's a small watercolor by the artist Matthew Ritchie—a kind of schematic colorscape with Einstein's Equation (which governs general relativity) scrawled across the bottom. Ritchie is generally interested in systems of symbols, some from physics, some from cartography, some from magic and language—I suppose, in some indirect way, I recognize someone else who is interested in that odd corner of concerns.

Thomas Beischer and Marion Lee

Exploring the Para-Site

Shirley Tse's Plasticity of Material and Meaning

Like other artists who work with plastic, Shirley Tse's is fascinated with material and the repercussions of the ready-made.¹ Her installations, however, argue for more than just using plastic in its myriad of forms—packing molds, bubble wrap, drinking straws, vinyl sheets, Styrofoam insulation, or hoogie boards. Tse is motivated by the fascination with the cultural and philosophical implications of this ubiquitous denatured material. These implications are deployed in her art as allegory to configure the fluidity of modern subjectivity in the globalized world.²

Working predominately in Styrofoam, the most recognizable form of foam polystyrene, Tse explores the ability of plastic to morph its functionality to its context.³ By using processes of sculpting, cutting, sewing, and building, Tse critiques the material's industrial versatility by bringing into play her probing interest in the binary, culture / nature, by which contemporary identity is frequently defined. Her art, therefore, not only shows the expressive range of Styrofoam and other plastic forms, but also provides insights into the unstable conditions, impacted by the changing geopolitical situations, for identity formations.

Tse's latest installation, *Isopor* (2003), is emblematic of this process. Its simple construction of six pale lavender Styrofoam coolers with tops (9" x 12") reveals its complex character on closer inspection. (Figure 1) Mobility, an essential mark of globalization, permeates all aspects of the installation. *Isopor* is the brand name of polystyrene products manufactured by the Knauf-Isopor group in São Paulo, Brazil but the actual material source of the coolers is Hong Kong, the city where Tse grew up. The artwork reinforces this story of transportation and of travel in its design and decorative motifs—the presence of the elegant slim case, the wheels on the two "carts", the "handle" that mimics a giant Brazilian comb, the motifs of sun umbrellas and of concentric circles formed by isosceles triangles, reminiscent of the double circles on the local plastic bills *dez raris*, "ten reals."

As in the case of *Isopor*, Tse's choice of plastic allows her art to reflect the characteristics of places without representing those

sites.⁴ The description of Hong Kong by Ackbar Abbas, the literary and cultural critic, points out the important connotation of her choice of material:

[It is] primarily a space of facilitation. It is less a site than *para-site* in that its domination in its region is due largely to its geographical proximity to China, together with this accessibility to the rest of the world. ...The para-site therefore connotes a position that in some strange way is both autonomous and dependent at the same time, a position in which autonomy is paradoxically a function of dependence.⁵

Having grown up in this city characterized by its facilitating agency, Tse has been exploring the properties of plastic and the plasticity of meaning in different contexts. At the critical level, Tse's art also transcends the cliché frame of reference, East and West, in which the art of, or associated with, Hong Kong is frequently perceived.⁶ Rather than taking refuge in this binary cultural category, her installations narrate and configure the fluidity of identity.

Plastic City

Plastic permeates the culture of Hong Kong. From the enormous range of plastic bags issued by different shops to consumers, or purchased tote bags and backpacks, to myriad objects for daily use and Styrofoam cushioning that ensured the safe shipping of goods from and to overseas, plastic formed the daily landscape of Tse's life growing up near Kwai Chung port with its multi-berth container terminals, all built on reclaimed land. The constant arrival and departure of containers bearing different corporate names painted in multi-color offered visual evidence of how the artificial could define a natural state of being. Tse has reflected in her writings on the ability of the artificial to carry traces of an authentic culture:

If the 'artificial' as the 'unnatural' reflects Westerner's hang ups on the nature/culture binary, wouldn't it mean something different for us who don't see such



Figure 1

a binary? ...New generation Asians were born into a technologicalized society, so technology and its artificial products are our culture. Artificiality for us is better understood as an intensification rather than a copy, an enemy, or a substitution.⁷

Operating during Tse's youth as a colonial city in a post-colonial world and a global economy before the rise of globalization, Hong Kong provided a unique state of instability from which to begin the exploration of identity. Abbas argues that the identity of Hong Kong remains in constant flux, "The city is not so much a space as a place of transit... A port city that used to be located at the intersections of different spaces, Hong Kong will increasingly be at the intersections of different times or speeds."⁸ The "port mentality" and "floating identity" of the city have posited an underlying sense of the temporary and transient, valorizing the import. This mentality was, however, ruptured by two events in the eighties, the signing of the Sino-British Joint Declaration on 19 December 1984 that decreed the return of Hong Kong to China on 1 July 1997, and the Tiananmen Massacre of 4 June 1989 in Beijing. The anxieties about the change to an estranged alien administration brought about the urgency for self-identification and the desire to develop Hong Kong's own cultures.⁹ These desires imbue Tse's art.¹⁰

Plastic Material

"...more than a substance, plastic is the very idea of its infinite transformations..." Roland Barthes observed.¹¹ Plastic's multiplicity in terms of appearance, properties, usage, chemical make-up and technical production ("a wonderful material of a thousand uses") defies the dichotomy between surface and depth. Take the example of a newly-purchased computer still in the original box from the manufacturer. Plastic makes up the packing material (large thin vinyl sheet and bulky packing

moulds) as well as the content—essential parts of the machine (circuit board, utility cards, switches, the body, cord, and plug). As Tse writes, "It might seem strange to talk about plastic, now when new technologies are cyber and digital. However, let us not forget that plastic is practically the material condition for most technological innovations."¹³ Plastic's ability to take on so many forms allows it to serve in varying instances as structure and surface. "Plastic, being post-human, renegotiates the hierarchy and challenges such oppositions by forging a simultaneity of both."¹⁴

Tse's most in-depth investigation of the properties of plastic in relation to surface, structure, as well as identity comes in *Polymathicstyrene* (2000).¹⁵ (Figure 2) Using a mechanical hand router, she carved each of the two hundred pale blue polystyrene blocks, the material used commercially for insulation. Tse literally mined the material for meaning. Displayed at waist height and encircling the four walls of a gallery, the work hovers inches away from the wall supported by diagonal brackets of the same material. The suspension of the piece reminds the viewer that it is both strong and light, properties that render the material ideal for industrial applications. At the same time they induce an unworldly quality in the installation. Even the title signals that the overlapping of multiple perspectives (polymath+polystyrene) is inherent in the sculpture.

Through the process of handcraft, Tse revealed meanings hidden in the mechanically produced blocks. She provided a key to her process in a single block by creating a series of indentations using different sized router bits. From this limited vocabulary, Tse created a series of connected blocks that altogether function like an unfurled scroll. In the absence of a single perspective,



Figure 2

the viewer reads the contiguous blocks as single expressions, diptychs, and sometimes triptychs. The meanings of these sculptural units are as malleable as the materials: some blocks appear like models of archaeological ruins, others like magnified circuit boards, and still others like miniature landscapes rutted by time and natural forces. By collapsing the boundary between substance and scale, as well as merging positive and negative forms, Tse reminds us that a defining quality of plastic is its ability to adhere to any form.¹⁶

Polymathicstyrene emerged from Tse's early small-scale experiment with the construction of Styrofoam packing material, such as *Untitled* (1996), in which Styrofoam packing blocks are used to build a large-scale sculpture. (Figure 3) In this piece, she began investigating "the space in-between" products and their containers.¹⁷ Tse constructed Styrofoam blocks, which normally functioned as packaging stabilizers of electronic products, into an unstable conglomeration, relying on the non-existent mass of each individual block to hold the entire structure together.¹⁸

Furthermore, Tse emphasized the industrial production of Styrofoam by meticulously hand cutting vinyl and covering each oddly-shaped form with machine-like precision. The particular process reminds one of Donald Judd in his mimicry of the industrial process, but the sense of abstraction in Judd's work is denied through the reference to familiar packing shapes. By using material identified with transportation and shipping containers, Tse articulated that space cannot simply be described as filled or empty. By attempting to give Styrofoam that occu-



Figure 3

pled "the space in-between" a new identity, she highlighted its normally forgotten role as well as its means of production. The shapes of the packing blocks that are contingent on the forms of the objects they support reveal Styrofoam's hyper-dependence on its context for meaning.

Plastic Context

Tse's art dwells on the process of transit and the theme of travel that are seen in her use of packing molds in *Untitled* and in such references made with respect to the destination São Paulo in *Isopor*. Tse visited the city as an exhibiting artist at the recent Biennale and described the culture there as "saturated with Styrofoam."¹⁹ From colorful boogie boards used to surf the local waves to beverage coolers encasing beer and other drinks in the tropical heat, plastic molds itself to the needs of a particular culture. By investigating the multiple forms of plastic's saturation, Tse believes the substance also "provides numerous vantage points from which we can look at technology."²⁰

Paul Virilio, the French philosopher who theorizes how technology has fractured society and broken the border between the city and its periphery, provides further insight into Tse's engagement with nature (the America Southwest, deep snow and ice, to be discussed later) as a strategy to present plastic's denatured character. He argues that the expansion of urban space beyond its traditional limits has created a sense of dislocation:

...no longer has a form with the exception, however of this "form-image" without dimension, this point, this *punctum* that is everywhere such that the measurable expanse is nowhere, following the example of this *nodal*, this Pascalian node, center that excludes all "circumference," the very idea of any "periphery."... this crisis of national identity, the resultant crisis of territorial citizenship, of localization, is a circumstance beyond measure affecting simultaneously places, men, justice and law, *politically comparable to the crisis of the notion of dimension*. . .²¹

In the same respect, Tse observes that natural landscapes, which have not been impacted by urban sprawl, highlight plastic's instability of form—an instability rarely noted in the urban context where plastic is ubiquitous.

In *Not Exactly A...* (1998) (Figure 4) and *Diaspora?Touristy?* (2000) (Figure 5), Tse placed plastic sculptures in "nature", such as on icy ground and the rocky surface in a red rock cliff, both away from traces of human dwellings, to emphasize the "nature" of plastic. The point made is that in human society, so saturated by its presence, plastic's nature is naturalized or elided. *Diaspora?Touristy?* shows a series of simple box sculptures that were sown from pieces of bright blue bubble wrap. They stand out starkly in the Southwestern desert, traversed by Tse



Figure 4



Figure 5

on a cross-country trip. Analogous to the imposition of handcraft on the Styrofoam blocks in the *Untitled* and *Polymathicstyrene*, the monotonous desert landscape with its odd rock formations and the lack of vegetation highlights the manufactured status of the sculpture's hand-sown translucent surface. A dialogue is established between the unnatural qualities of nature and the properties of plastic that adapt to its surrounding.



Figure 6

Similarly, in *Not Exactly A...*, Tse placed humanoid looking forms constructed from shocking pink smooth plastic onto the icy Canadian landscape during her artist residence in Banff, British Columbia. Even though the plastic seems to share an iridescence similar to that of the surrounding ice, its ability to adapt to this otherworldly natural landscape is called into question. Tse seems to suggest that the limits of plastic's ability for expression lie in its context, or more appropriately, in its ability to adapt to contextual demands.

Tse's confrontation with the natural is seen most clearly in her construction of an entire world of her own in *Shelf Life* (2002), which is her only installation that comprises custom-fabricated parts.²² (Figure 6) The environmental installation recalls a small segment of *Polymathicstyrene* magnified multifold into human scale.²³ *Shelf Life* is designed for audiences to walk across its irregular Styrofoam form: an undulating central platform connected to a smaller irregular island by a serpentine ledge. Tse hints at the evolution of her work in writing, "Plastics are mutants of nature, and in their course of mutation, they redefine nature altogether."²⁴ The main platform and its umbilical extension provide receptacles of soft plastic that give way to individuals who sit or lie down before returning slowly to its former

self on the release of pressure. The yoking of the monumental scale and the inviting malleable surface in the landscape make up a new environment that is alien and seductive. In negotiating the plastic landscape, we are reminded of the brittleness of Styrofoam, normally used for protecting objects that squeaks and gives way under our bare feet. At the same time, even the illusion of the unique plastic environment is belied by the over-determined saturation of plastic in our daily life.

Plasticity of Meaning

Cultural anthropologist Arjun Appadurai has discussed the importance of "mass migration" and the media in the formation of modern subjectivity. "Deterritorialization" refers to "ethnic groups, sectarian movements, and political alliances [which] operate increasingly in ways that transcend territorial boundaries and identities."²⁵ In this respect, ethnography becomes "What is the nature of locality as a lived experience in a globalized, deterritorialized world?"²⁶ Tse's art acknowledges this question by representing the plasticity of meaning in form. Through the displacement of the naturalized dichotomy between culture and nature, Tse configures an identity that embraces the inherent instabilities of social relationships in a globalized world, and which at the same time resists forces that attempt to push identity formation into image production and the eventual erasure of difference. Tse promotes plastic simultaneously as the substance for this reshaping and as the means by which to recognize the formation of unstable identities in contemporary society.

Notes

1. We are grateful to Professor Pamela Lee at Stanford University for her critical comments on an earlier version of the paper, and we thank Shirley Tse for making available her two unpublished conference papers. For a recent survey of artists investigating different aspects of plastic see Nancy M. Doll, *One Word: Plastic* (Greensboro, NC: Witherspoon Art Gallery, 2003).

2. Some of the more well know efforts to critique the effects of the global economy include the work of Multiplicity, the Milan based group of artists, architects, photographers and urban developers who focus on contemporary European cities and their ongoing changes, the recent photography of human migrations by Sebastiao Salgado, and the photography and writings of Allan Sekula, which tracks the transformations of world labor. See Multiplicity, *USE, Uncertain States of Europe* (Milan: Skira Editore, 2003); Sebastiao Salgado, *Migrations: Humanity in Transition* (New York: Aperture, 2000), and Allan Sekula, *Allon Sekula: Performance under Working Conditions* (Vienna: Gerneralei Foundation, 2003).

3. Although polystyrene, a strong plastic created from erethylene and benzene that can be injected, extruded or blow molded, was first discovered in 1839 by German apothecary, Eduard Simon, it was Dr. Leo Baekeland who invented the first entirely synthetic plastic in 1907, patenting it under the name Bakelite. Plastic became more prevalent in society after BASF developed ways to commercially manufacture it in 1930. Styrofoam, polystyrene's most recognizable present day form, was introduced by Dow in 1954. See Stephen Fenichell, *Plastic: The Moking of a Synthetic Century* (New York: Harper Collins, 1996) and Penny Sparke, ed. *The Plastic Age: From Bokelite to Beonbogs and Beyond* (Woodstock, NY: The Overlook Press, 1993).

4. *Isopor* was completed in February 2003, two months after Tse's return, as an exhibiting artist, from the 26th São Paulo Biennale.

5. Ackbar Abbas, *Hong Kong: Culture ond the Politics of Disappearance* (Minneapolis: University of Minnesota Press, 1997). 74. Para/Site Art Space is the well-known artist-managed exhibition space for installation art in Hong Kong. With support from the local Arts Development Council made available in 1995, exhibitions at Para/Site began the year after. Four years later, *Plastic Works* that included some of Tse's important works was shown at Para/Site. In addition, the Parasite Collective is a group of international artists based in America. See David Clarke, *Hong Kong: Culture and Decolonization* (Durham, N.C.: Duke University Press, 2001), 70-99 and Drazza Fratto O'Brien, *Shirley Tse: Sculpture and Photography 1996-2000* (Hong Kong: Para/Site Art Space, 2000).

6. East and West, the handy binary continues its influence as the reified systemic monolith or as the specter in scholarship on the contemporary art of Hong Kong as well as of China. See, for example, Clarke, *Hong Kong Art*, especially pages 13-37. Gao Minglu, "Towards a Transnational Modernity: An Overview of Inside Out: New Chinese Art," *Inside Out, New Chinese Art*, Gao Minglu, ed. (Berkeley, CA: University of California Press, 2001), 19, 27, and more recently Britta Erickson, "The Reception in the West of Experimental Mainland Chinese Art of the 1990s," Wu Hung et al, *The First Guangzhou Triennial, Reinterpretation: A Decade of Experimental Chinese Art* (1990-2000) (Guangzhou: Guangdong Art Museum and Chicago: Art Media Resources, 2002), 105-112.

7. Shirley Tse, "Post-colonial mutation and artificiality: Hong Kong a case study," unpublished manuscript presented at the Chance Conference, Las Vegas, Nevada, 8 November 1996, unpaginated.

8. Abbas, 4.

9. Abbas explains, that, "It is not true, as some might wish to believe, that if you scratch the surface of a Hong Kong person you will find a Chinese identity waiting to be born...This suggests that 1997 will not be simply the moment of liberation from colonial rule; it will also mark a moment of transition to a form of governance that has no clear historical procedures." Abbas, 2.

10. Tse experienced the democracy movement first-hand, having gone to Beijing with a delegation from Hong Kong sometime before the fateful day. Subsequently, disenchanted with the disintegrating movement for a number of reasons, she made her own way back on land to Hong Kong. Authors' interview with Shirley Tse, April 26, 2003.

11. Roland Barthes, "Plastic", in *Mythologies*, Annette Lavers, trans. (New York: Hill and Wang, 1972), 97.

12. Andrea DiNoto, *Art Plotic* (New York: Abbeville Press, 1984): 24. quoted in Shirley Tse, ""Technology, plastic, and art", unpublished manuscript presented at *Art and Technology*, 22nd annual conference of the International Association for Philosophy and Literature, University of California, Irvine, May 1998. 6.

13. Tse, "Technology, plastic, and art," 3.

14. *Ibid.*, 9.

15. For reviews of this installation see Ralph Rugoff, "Ralph Rugoff on Shirley Tse," *Artforum International* 39, 5 (Jan. 2001), 122; Lisa Panzera, "Shirley Tse at Murray Guy," *Art in America* 89, 1 (Jan. 2001), 119; and Drazza Fratto O'Brien, "Shirley Tse and Tran T. Kin-Trang at Shoshana Wayne Gallery," *Artweek* 31, 6 (June 2000), 21-22.

16. Jessica Bradley, *Provisional Worlds* (Toronto: Art Gallery of Ontario, 2002), 18.

17. Drazza Fratto O'Brien, "The Flow of Plastic," *Shirley Tse, Sculpture and Photography 1996-2000* (Santa Monica, CA: Shoshana Wayne Gallery, 2000), 2.

18. *Ibid.*, 2.

19. Authors' interview with Shirley Tse, 26 August 2003.

20. Tse, "Technology, plastic, and art," 4.

21. Paul Virilio, "Critical Space. " in *The Virilio Reader*, James Der Derian, ed. (London: Blackwell, 1998), 59-60.

22. Shelf Life was exhibited at the Wattis Institute, California College of Arts and Crafts in late 2002, followed by another showing at Shoshana Wayne Gallery. Subsequently, the installation was dismantled. See Ralph Rugoff, "Fantastic Plastic," *Shirley Tse: Cupp Street Project Shelf Life* (San Francisco: CCAC Wattis Institute for Contemporary Arts, 2002).

23. Ralph Rugoff. "Fantastic Plastic," 1.

24. Tse, "Post-colonial mutation and artificiality: Hong Kong a case study."

25. Arjun Appadurai, *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: The University of Minnesota Press, 1996), 2-10, 49.

26. Appadurai, 52.

Jedediah Smith Ela

Using Money to Suspend Heavy or Fragile Objects

Exploring an Alternate Building Material

This work is excerpted from selections of the author's Master's thesis at MIT: *Using Money to Suspend Heavy or Fragile Objects*, 2003.

Abstract

The author suspends a 700-lb steel money safe from the ceiling, using ropes constructed from approximately 10,000 United States \$1 bills. [...] It is noted that the presence of money has an irritating effect on most viewers, and hypothesized that this effect is based on the installation's exposure of differences in financial wealth between different persons. Accordingly, a proposal is made for the reduction of economic inequality by wasting the excess wealth of the very rich, and it is suggested that the author's artwork both enacts and visually supports this proposal.

Declaration of Market Intent

1. The selling price of money objects shall be the face value of the money used.
2. Resale prices shall be limited to face value by binding contracts.
3. Objects may be disassembled and the money returned to circulation.

Lab Tests

I needed to know how strong dollar bills were as hanging the safe had to be approved by an engineer. The strength of the ropes would be affected by their thickness (the number of bills in cross-section), as well as by the way they were woven together. (Figure 1) I had first tested the ropes by pulling on short pieces between my two hands. For more leverage, I would put a loop around my foot and pull on the ends. And for even more, I would put the loop over a sprinkler pipe in my studio and pull myself up on it. (Figure 2) But these tests did not give numerical results. I wanted to hang a safe from the ceiling, and the engineer wanted numbers. So I had to find a lab. I walked all over MIT looking for a lab that could test ropes. Finally I found



one that could do it, but their machine did not have the right grips. The grips are the parts that grab onto the material to be tested. The lab's grips were not large enough to grab my dollar-bill ropes, so I had to make my own. I made the parts for them in the machine shop. It took a few days. The man at the lab was very busy and I was having a hard time making an appointment for the test. Finally he called me late one afternoon and said I should come over right away. I was at the machine shop when he called, and had just finished making the parts for the grips. But I had not welded them together yet. I like to make beautiful objects, whether they are to be shown as artwork or just used as tools for making something else. So I had worked on the grips for much longer than necessary. The grips only had to hold rope but I wanted to make all the edges smooth and all the surfaces shiny. I was planning to weld the grips in my studio but I didn't have time to go back there. The lab had a welder, so I brought the grips in pieces so that the lab man could weld them. I would have welded them myself, but his welder was different than mine and I didn't know how to use it. So he welded the pieces together. He did it really fast and messy, and I went in the other room because I couldn't watch. When he was done my beautiful grip-parts were covered with soot and weld-spatter. But they were welded together, and we started the tests right away.

First we tested dollar bills which were not assembled into ropes, just folded up in quarters lengthwise, to see what was the strength of a single bill. (Figure 3) The lab man and his friend made a lot of jokes about the "strength of the dollar." It turned out that the strength of the dollar is about sixty pounds. The machine tested the dollars by gripping onto the ends. It was important to put a little piece of paper between the dollar and the metal jaws of the grip, so that the force of gripping would not cause the dollar to break right at the jaw. That would have been a "bad test." We put the dollars in the grips and tightened them, and then the machine started to move the upper grip higher very slowly. It made a quiet humming noise while it did this. You could barely see it move. As it moved the lab man watched numbers on the console. There was a red number that would show how far the upper grip had moved. There was also a computer where the force of the pulling was shown and recorded. The farther the upper grip moved, the more it stretched the dollar, until the dollar tore. The computer recorded the force and the maximum force it recorded was the strength of the dollar.

So the red number would go up and the bill would get tight and then it would snap and the lab man would turn off the machine. For the single-dollar tests we tested three new dollars and three



Figure 1 (facing page)
Figure 2 (left)
Figure 3 (center)
Figure 4 (right)

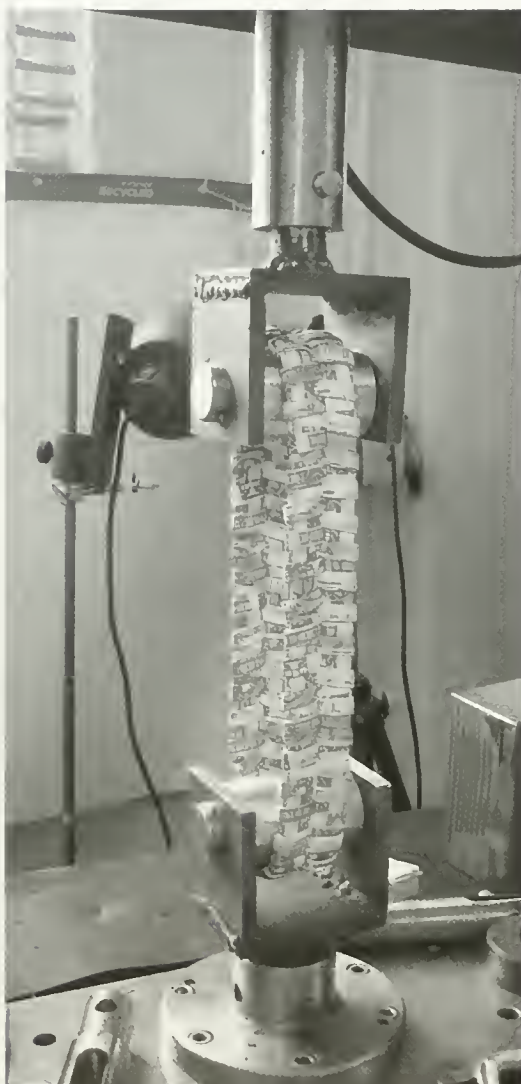


Figure 5

old dollars. (Figure 4) The three new dollars held 59.6 pounds, 58.5 pounds, and 61.2 pounds. The old dollars were weaker. They held 49.5 pounds, 55.6 pounds and 51.3 pounds. Actually, the computer measured in Newtons. There are 4.44 Newtons in a pound. After each dollar snapped, the lab man would tell me its strength in Newtons and I would write it on a piece of paper and divide it by 4.44 to see how many pounds it was.

After we finished testing single dollars it was time to test the ropes. (Figure 5) I put the new weld-spattered grips on the machine. The regular grips grabbed onto the ends of the dollars like pulling on a stick between your fingers. My new grips had rollers that went inside the loop and pulled it like you would stretch a rubber band.

The lab man started the machine, and the force numbers on the computer started to climb. The lab man read them off every second or two. The upper grip moved higher very slowly. The lab man got impatient and pushed a button to make it move faster.

The strap got very tight and then it started clicking. The lab man was still reading numbers off the computer screen but they were not getting any higher. The machine kept humming and pulling at the strap very slowly, and the strap kept clicking. We put our faces near the strap and tried to see what was happening. It was hard to see but we figured that the bills must be slipping apart instead of breaking. In these straps there were long fibers that went the length of the strap and smaller ones that went crosswise to hold them together. The bills in the lengthwise fibers hold together by friction. They are folded together in an interlocking way so that just the friction of one bill against the other holds them from slipping apart. The more the dollars are folded over, the more they press against each other and the harder they are to pull apart.

So a 1/4 fold fiber (with the bills folded in half twice) is weaker than a 1/8 fold (where they are folded three times). The strap we were testing was 1/4 fold and the fibers were woven. In a woven pattern the fibers go in two directions, kinking over and under each other. The kinking also helps keep the bills from slipping apart. As the machine pulled, it was pulling out all the kinks so the fibers were straight. That left only the friction to keep them together and the 1/4 fold did not give enough friction. The clicking was the sound of the bills slipping apart, bit by bit, to accommodate the longer length between the two grips. The rope was stretching out. It had reached its maximum strength and now it was breaking, but very slowly. The lab man turned the speed up even faster. The rope clicked faster and we could see it pulling apart. It was definitely broken. The lab man turned off the machine and I recorded the maximum strength. 1166 Newtons or 266 pounds. The design was flawed. The dollars were slipping apart rather than breaking. The inefficiency

was unsatisfying. A good design would break rather than slipping.

We tested another two straps made in the same way, and they slipped as well. Finally we tested a small piece of 1/8 fold strap. It held nearly as much as the other three straps, even though it was much smaller. The extra fold made the difference, and I knew that the new rope design, for hanging the safe, would have to use the extra fold. I didn't like to learn this, because the extra fold was a lot of work. But there it was.

Machine Shop

I worked on a lathe for several days while making the ropes to hang the safe. The assistants I had hired folded dollar bills into quarters, and assembled them into sticks of 12 bills. The next step was to fold the sticks in half again into 1/8 the width of a dollar. After that, I would braid the 1/8 fold sticks into ropes, softening them with water as I braided. Folding the 1/4 fold sticks in half was difficult, and hard on the hands. To fold one stick was nothing but twenty would take an hour and would leave your fingers aching. To hang the safe I needed nearly a thousand dollars. I could not fold them all myself, and I did not want to use the assistants, because doing a good job was difficult and painful. Besides, I had spent enough on assistants. The point was to braid money into ropes, not spend it on assistants. I first made a machine like a sheet-metal break to fold the sticks. But it was slow and cumbersome. The pasta maker was the next generation. (Figure 6) I made a special attachment that would guide the stick into the rollers, and start folding it in half at the same time. Then the rollers would grab the end, pull the rest of the stick through the attachment, and crease the fold. The original pasta maker was built for rolling soft pasta dough, not stiff sticks of dollar bills, so I had to make new rollers for it in the machine shop.

[...]

After I finished the machine and made the ropes and hung the safe, (Figure 7) I dropped by to give him [the machine shop man] an invitation for the opening. He had already received one in the mail. He said he thought there was something funny about this work. "I've been thinking about your installation" he said, "and I've decided you must be making some kind of statement against money."

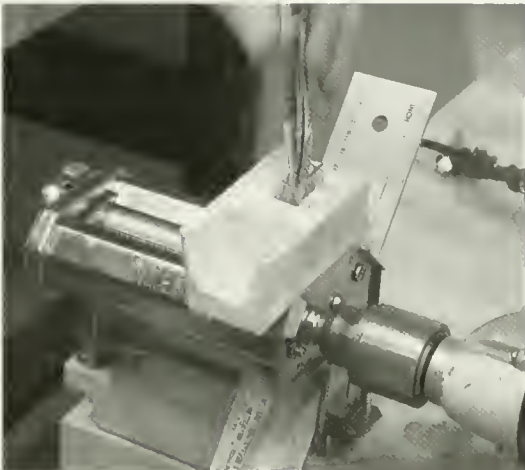


Figure 6



The author with his ropes



Figure 7

Raoul Bunschoten

Incubator Chambers

Cutting the Horizon (2)¹

Viking ships cut the horizon in order to explore the beyond. They are built both as a knife, to cut the edge between water and sky, and to have a horizontal expansion, so that the ships can float on the water. Their shape is a double invagination of both the vertical and the horizontal; a space in which the men live that go east and south to raid Europe and west to touch the shores of America. Viking ships are the means and the visual expression of exploration. (Figure 1)

Though they are just an image in relationship to the current frontiers in urbanism, I have always admired the Viking combination of the compact but elegant ships with the use of the knot, both as essential device on their voyage and as emblem—the two mythical dragons intertwined in an eternal battle between good and bad, iconic of a dynamic universe which they set out to explore and conquer.

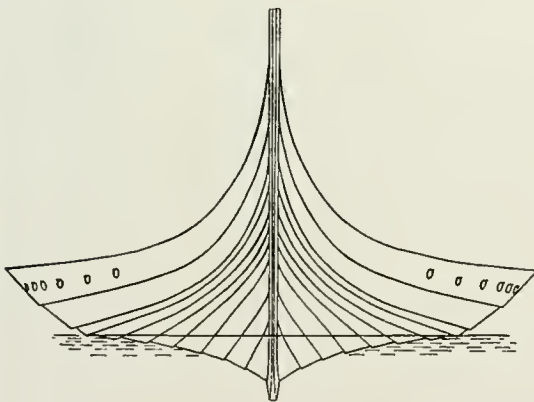


Figure 1

The Skin

Today, I see two kinds of frontiers in urban development: the very thin “Skin” of the Earth, where the majority of the world’s population now lives and the second Skin of the urban organization.² The frontier is situated between these two skins. It is a horizontal frontier between what appears on the surface of the second skin, in the layer of the city—its dynamics, conflicts, emergent trends—and the proto-urban forces that act on this surface, are the driving force of its dynamics. They are

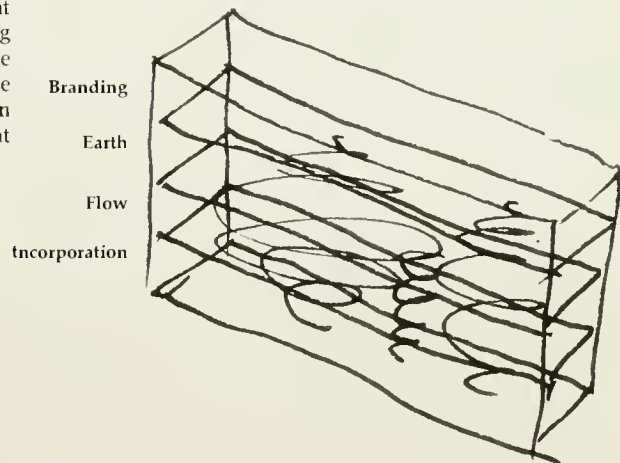


Figure 2: Urban Gallery (tool for urban exploration) - Branding contains conditions of naming, marketing, identity, creation, cultural production, memory, remembrance, creating values and communicating these values, images and imaginary conditions, narration and scripting. Earth contains conditions of land, waters, air, natural processes, ecological issues, biodiversity, but also of land ownership, territory, and rights concerning the surface of the earth, spatial organization. Flow contains all processes that create flows through the Urban Gallery: exchange of money, traffic goods, informatinn, mobility, waste, sewage, the economy of the site. Incorporation includes political actions and constellations, institutions, and institutionalization, community formation, organizations of various kinds, groups, legal bodies, legal actions.

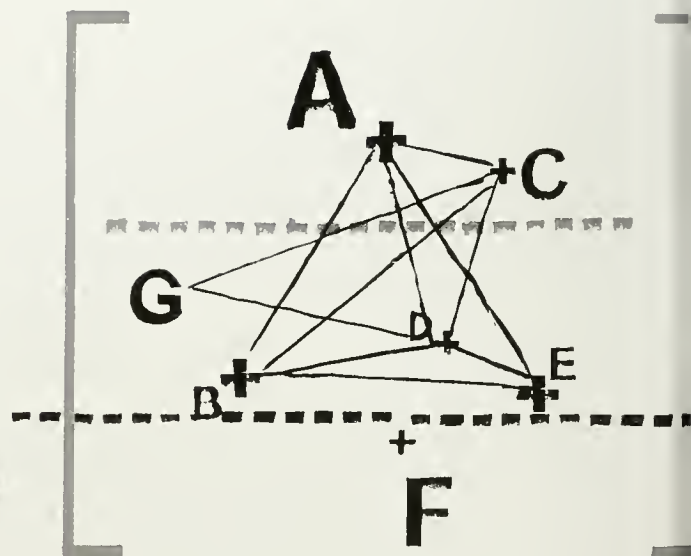
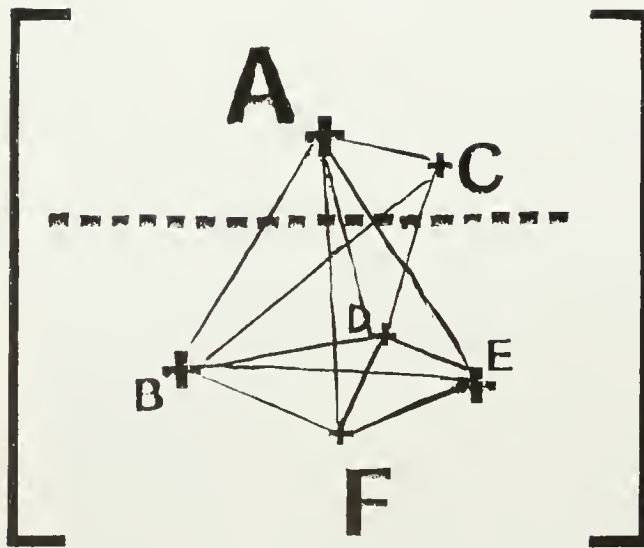
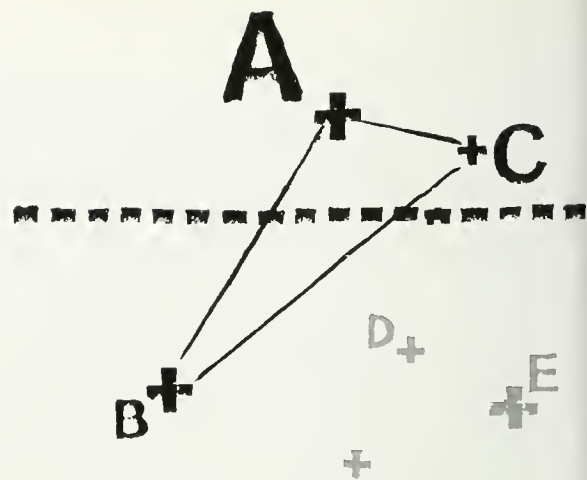
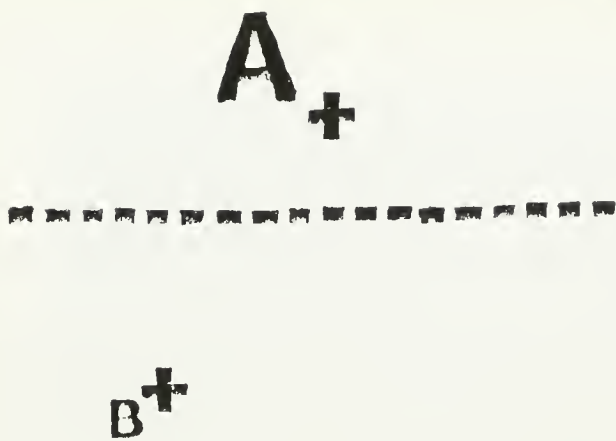


Figure 3 (upper left). conflict
 Figure 4 (upper right). negotiation
 Figure 5 (lower left). (non-)settlement
 Figure 6 (lower right). introducing a new conflict

Conflicts are stepping stones in the unfolding of scenarios—tools triggering interaction between actors and agents that otherwise would not meet. Stepping stones are instruments for managing urban change.

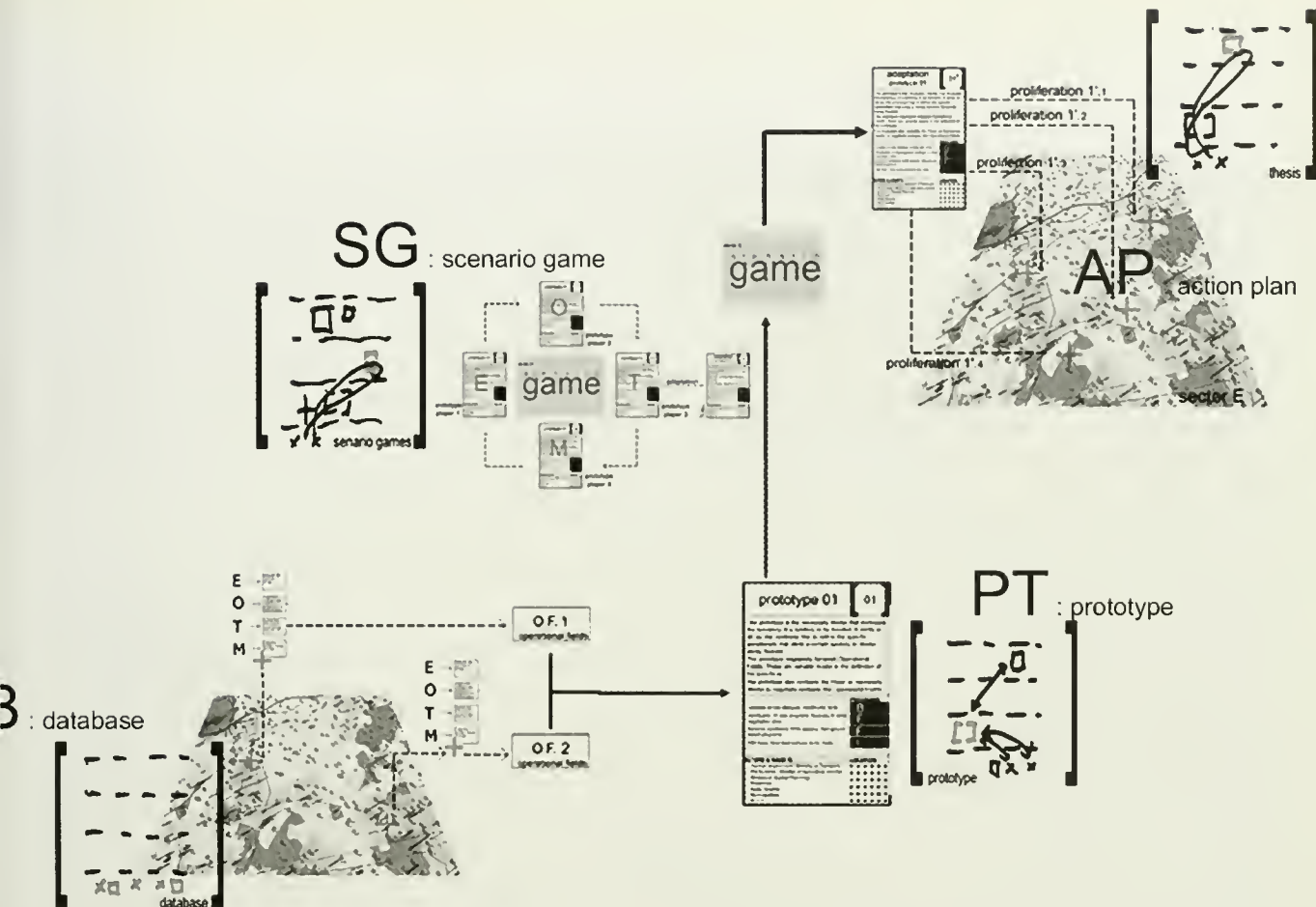


Figure 7. Example of the four layers of the Urban Gallery

located in the first Skin, either physically or conceptually. The relationship between these two skins creates the complexity of urban form, especially since proto-urban forces have become, to a large extent, global in nature, that is, they occupy the totality of the First Skin. The constant challenge we face is to cut through the Second Skin and see these forces in their nakedness, see where they originate or which path they take inside this metaphorical Skin of the Earth, understand their intertwining as a principle and observe its symptoms locally. The tools for exploration that we are in the process of developing have to consist of the cutting and the observation of nature, and be able to create a space in which samples of intertwining relationships between the two skins can be mapped, simulated, and cultivated—that means modified and redesigned, or even reinvented.

Political or Geological Divides: Second Skin

A totally different frontier is that of the political or geological divide, which becomes an attractor for new developments in

the second Skin. These frontiers need urgent exploration in the way they evolve new urban forms, either during their existence or when they dissolve or transmute. Future public spaces may act as attractors of development. The exploration of these sections of the second Skin is complex: it requires an overview of cross-border phenomena in a frame of space straddling the frontier, as well as observations of the dynamics in systems that are specific to one side of the frontier, observing symptoms that happen in separate spaces. The complexity is increased by the fact that these symptoms may relate in a synchronic or diachronic manner. Not only are there differences in language, but there are differences in cultures, habits, politics.

First Frontier

An example of the first frontier: Brick Lane in London. First settled by Huguenots fleeing religious persecution in France, then settled by Jews coming from other places in the European continent, and then by Bangladeshis, who currently form the



Figure 8. Taiwan Strait

main population. But now Brick Lane is also becoming a center of new cultural activities, a focal point of digital and multimedia professions and art forms. Woven through this fabric are strands of untouched Georgian architecture and tales of Jack the Ripper. A much more complex example is one urban situation in India, especially in the state, Gujarat, where Hindus and Muslims live together in a constant tension which occasionally erupts into violent conflict. The tremendous future that India has is tempered by the volatility of the interactions between the two skins, because of the difficulty that the different groups and layers of society have of intermingling and coexisting.

Urban Frontiers within the Skin

An example of urban frontiers within the Skin itself: the Taiwan Strait is a body of water between mainland China and Taiwan. It is a political frontier. While China is practically at war with Taiwan because of its stated intentions to be a sovereign state, China also considers Taiwan to be an integral part of mainland China. The Fukien province, the territory closest to Taiwan on the mainland, is increasingly being settled by Taiwanese businesses who use the cheaper labor there. This leads to an intense web created by off flows of capital, information, culture, and people between the two territories. My research group, CHORA, is currently preparing a demonstration project for an

Urban Gallery about the Taiwan Strait, in collaboration with British, Taiwanese, and mainland Chinese institutions. This project aims to see how the space of the Taiwan Strait and its immediate surroundings turn into an urban network space, despite its political significance.

Other examples are land frontiers that become spaces of generation: the frontier between Mexico and the US near Tijuana and eastwards. This frontier is the fulcrum of several emergent metropolitan areas. The frontier between North and South Korea will, in the near future when it dissolves, become a generator of massive changes in Korea, more extreme in their nature and urban impact than those in Germany after the fall of the Wall.

There are strange new frontiers appearing in places such as Rio de Janeiro, where the main *favelas*, informal and illegal settlements built by poor people for themselves, are not drawn on the city maps, although many thousands of people live there. Moreover, they are plainly visible, rising out of the city onto the hillsides around it; these settlements are invisible on Rio's maps, just as West-Berlin on the maps of East-Berlin. In Sao Paulo there are over three hundred thousand unregistered addresses in the *favelas*. In other words, there are areas invisible for the state. When you take a taxi to a particular *favela* in Rio, the driver will stop at some point and tell you that that point is the threshold to the *favela*, and he will not go further. This is because at this threshold the control of the drugs organizations and youth gangs starts, and that of city and state ceases. For the innocent visitor, this may just be a threshold between the formal and the informal, but for those who know, like the gangs of other *favelas*, these boundaries are sharply drawn and are life-threatening.

Epic Geography

The term "epic geography," coined by the anthropologist Michel de Certeau, describes the way in which a place becomes the site of an evolution described by histories and ongoing narratives. The Taiwan Strait is a simple name and form—a strait, which attracts very complex developments. Epic geography describes the dynamics of a place; in the *favelas* it describes the dynamics of gang control, in other border zones the growth of exchanges, of settlement patterns based on cross border economies.

Exploratory Tools: Stirring the City

We need exploratory tools that empathize with this evolution, with these dynamics, and which can in some sense emulate and stir them simultaneously. With the Urban Gallery, we have been trying to develop a simple form for a device that acts in this kind of complexity and models the complexity in order



Figure 9: (from the *Community DNA* series)
"Communities"

We apply techniques that explore these dynamics through samplings and basic dynamic patterns that are used to describe the main processes in the dynamics of a sample. The Urban Gallery is a virtual space which is superimposed on a specific territory in order to tease out the trends, particular changes, movements, and conflicts and to apply a process of curation—urban curation in this case—a concept derived from the art field but not identical to it. The Urban Gallery is like an explorer's ship: it maps, gathers, and discovers, but also arranges and intervenes. We think it should stop short of colonizing, but in fact we need to be able to develop projects in these territories as well, so prototypes have to be implanted, which then evolve into their own strands of urban organisms.

Notes

1. "Cutting the horizon" is the title of an article that appeared in the magazine *B* about Raoul Bunschoten, issue 1989, Aarhus, Denmark
2. For an introduction to the terminology developed by the research group I am the founding director of, CHORA, see the book *Urban Flotsam*, Raoul Bunschoten, CHORA with Takuro Hoshino and Helene Binet (Rotterdam: 010 Publishers, 2001).

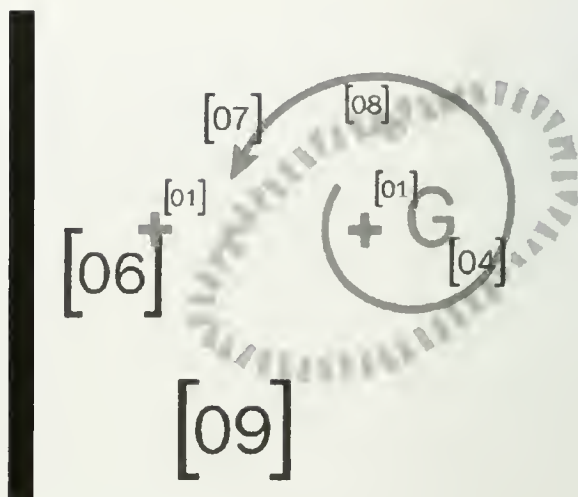
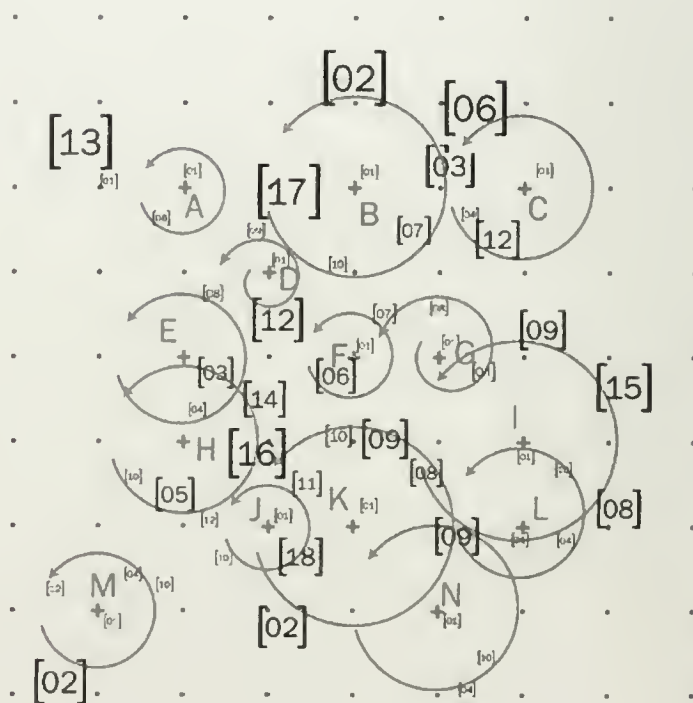


Figure 11 (below): (from the *Community DNA* series)
"Prototypes ([01], [02], [03], etc.)"



Brigitte Desrochers

Ancient Hardware

France Coming to Terms with the Discovery of Pompeii and Herculaneum

What makes Pompeii and Herculaneum extraordinary is that they are filled with ordinary things. Travellers often noted the fact in their letters and diaries, but for more than fifty years the spoons, knives, pick axes and shovels on display at the Portici museum challenged the cognitive habits of scholars and artists alike.¹ In fact, it took decades before extensive coverage of everyday wares from Pompeii and Herculaneum was available to the public.

Why? Because, in the mid-eighteenth century, very few people believed that a heap of rusty tools might ever be considered a significant discovery, and thus no one invested the time, energy, and money it would have taken to study and to publish the artefacts, so as to have them recognized as a real, and important part of the western cultural heritage.² This article is concerned with this long period of hesitation, between the unearthing of the artefacts in 1738 onwards and their discovery by the French public in 1770 with Auguste Denis Fougieroux de Bondaroy's *Recherches sur les ruines d'Herculanum...*³ and, more importantly, in 1807 with the third volume of Francesco Piranesi's *Antichità di Pompèia*, entitled *Usages civils et militaires trouvés à Pompèia et à Herculaneum*.⁴ Contemporary historians have identified some of the causes for this delay, yet this piece adds to their work, as it considers the hitherto unrecognized social and political aspects of the problem.⁵

Readers of Bruno Latour and other sociologists of science will be familiar with the notion that, just like a living body only digests what really feeds it, so too a society only "discovers" what can be of use to its own reproduction. Just like the world of scientific investigation, the realm of archaeological exploration is littered with projects that were never completed because no strong alignment of interests provided the labour and the capital needed to transform an unqualified find into a significant discovery.

The suggestion here is that the French did not "discover" ancient hardware until they had a use for it. They turned a blind eye to the mundane face of Antiquity as long as it contradicted the luxurious, monumental picture of Classicism that legiti-

mized the power of the ruling classes. Only at the end of the century, after revolutionary thinkers put forth new, pragmatic readings of the classical world in order to validate the power structure and value system of the *République*, did the Portici collection acquire a sense of relevance.

Charles VII, King of Naples and the Two Sicilies, presided over the excavations at Herculaneum and Pompeii. He created a space to display the finds, the Portici Museum, set up a team of scholars to study them, the *Accademia Ercolanese*; established a press, the *Stamperia Regale*, and produced a grandiose catalogue, the *Antichità di Ercolano*.

The King had exclusive rights over the ownership, the study and the publication of all artefacts from his excavations, but he never managed to stop wealthy foreigners from assembling private collections or prevent unauthorized publications abroad. Sir William Hamilton, British Envoy in Naples, assembled an important collection of ancient vases which he bought from local peasants and later sold to the British Museum. Vivant Denon, a French adventurer, did the same with another young institution, the Louvre. However, both collectors were after the art, not the hardware of Herculaneum and Pompeii. Hamilton's catalogue contained nothing but vases.⁶ Denon's book on Pompeii featured a spectacular sacrifice on the altar of the Temple of Isis, a group of women frolicking about in a lush peristyle garden, but no peasants tilling their land, no baker grinding his wheat, no servant preparing his masters' next meal.⁷

Charles had no trouble keeping the international community away from his ancient tools and utensils. Indeed, he seems to have been rather alone in finding them worth his care, just like he would be alone, years later, in arguing that pre-Columbian Art should be preserved rather than melted. He was also quite ahead of his time in the curatorial decisions he took with his intendant Bernardo Tanucci and a correspondent of the prestigious *Accademia Etrusca di Cortona*. Together they organized the collection in rational fashion, dividing it into broad typologies: a floor of their museum showed the wall paintings, some rooms contained the sculptures, others presented the bronzes.

Others, still, were home for the tools and utensils. Likewise, the first volumes of the catalogue featured nothing but paintings; the next volumes presented the bronzes, and so on and so forth. Unfortunately, the publication process was so slow, and hardware was so far down the list that the King died, the Academy dissolved and the series aborted before the volume was finished.

The first book on everyday wares from Pompeii and Herculaneum would be published in France, by a man who had no interest in ancient art, and no ambition at making a name for himself as an ancient historian. (Figure 1) Auguste-Denis Fougereux de Bondaroy travelled around Europe to study manufacturing processes, with the goal of improving the national economy, and raising the living standards of his fellow countrymen. He had written about *The art of quarrying slate, and of splitting and cutting it* for the Académie Royale des Sciences and about *The art of gold-plating and silver-plating leather* for Diderot and d'Alembert.⁸ He must have felt at home in Portici, committing to memory the many tools and utensils whose shapes had remained unchanged over the centuries: "a wooden comb, whose teeth are similar to those we use ... there is also a piece of a bit very much like our own bridles."⁹ He observed that "the ancients had, over seventeen hundred years ago, a very good knowledge of the melting down of metals; they brought copper to its pure state; they knew many ways of alloying it, they cast it, they melted it, and they could gold plate or silver plate it. They could gold plate silver, chisel metals, and inlay them."¹⁰ He actually believed the ancient technique of silver-plating superior to current practice, recommending its study.

To a pre-revolutionary mind this was like walking into a candy store and minding the plumbing. Diderot couldn't help but poke fun at him: "Monsieur de Bondaroy cares to know whether or not the Ancients were acquainted with the use of forks..."¹¹ In the *Encyclopédie* Diderot edited, Antiquity was illustrated, not by utensils, but by means of the five orders.

Still, a handful of intellectuals—Montesquieu, Rousseau, Mably, as well as Francesco's father, G. B. Piranesi—had argued that the foundations of Classical glory were: democracy, rational management of natural and human resources, technical mastery, and simple lifestyle. Their pragmatic, functional understanding of the classical environment percolated into popular culture through various channels. One of them was the *Voyage du Jeune Anacharsis en Grèce*, a small and entertaining historical novel by the Abbé Barthélémy.¹² It weaved hundreds of snippets of information about ancient technology, taken from well-known classical texts, into a fictional story, starring Anacharsis, a northern "barbarian" who travelled through Greece in the fourth century BC. When he walked down a busy

street, he minded not the beautiful palaces that lined it, but focused on a construction site, the builders who worked on it, and the manner in which they organized their trades. When he attended a play, he paid attention not to the scenery, but to the stage machinery. He did not mind the actors, but the spectators who "came and went, stepping up and down, shouting, laughing, squeezing and pushing, nagging the officers who were running in all directions, trying to maintain the order."¹³ The book struck a chord and became a best seller.

The French Revolution broke out a year later.

This pragmatic, participatory vision would soon be shared by members of the National Assembly, who modeled the new Constitution and the new laws after Ancient precedents. They identified with the great legislators of Antiquity, while the new, politically active citizens looked back to their ancient counterparts. They donned ancient togas, they carried polychrome statues and banners filled with inscriptions during the famous *fêtes révolutionnaires*. Because the National Assembly relied on agriculture and industry to rebuild the economy, and because it counted on the votes of peasants and artisans, tools often figured in these processions. In Rouen, "ploughmen walked up to the Nation's Altar with their tools wrapped in garlands, and laid them on it."¹⁴ In Paris, "among the Saint images of Law and Freedom, in the civic procession featuring the magistrates, the representatives, the Bastille's widows and orphans, one could see many emblems of the trades that were of use to mankind, agricultural tools, ploughs, sheafs..."¹⁵

At the time, tools also connoted power and security to the working classes. A majority of those who fought in the revolution did not take up firearms from the limited, and often inaccessible municipal depots, but rather the tools of their trades. According to Michelet, "the hand of justice, the sword of justice, for [the poor man], was whatever he happened to have, his scythe, his pitchfork in place of a gun."¹⁶ Many battles were won with these tools. Indeed, on the morning of July 14th, it was a cartwright who opened the doors of the Bastille, with nothing but his usual working tools: "he walked on, hatchet in hand, climbing on the roof of a small guardroom, next to the first drawbridge, and working peacefully, under a rain of bullets, cutting, bringing down the chains, bringing down the bridge. The crowd moved on; it got into the courtyard."¹⁷ Another, memorable scene took place a few months later, in Versailles: "At five o'clock in the morning, a great crowd was already assembled near the grilles, armed with picks, spits and scythes. There were no guns. They forced the Guards to shoot at them."¹⁸ That same day the King moved back to Paris, never to see Versailles again. It would be an overstatement to say that the revolution was fought and won with tools rather than weapons, but it is

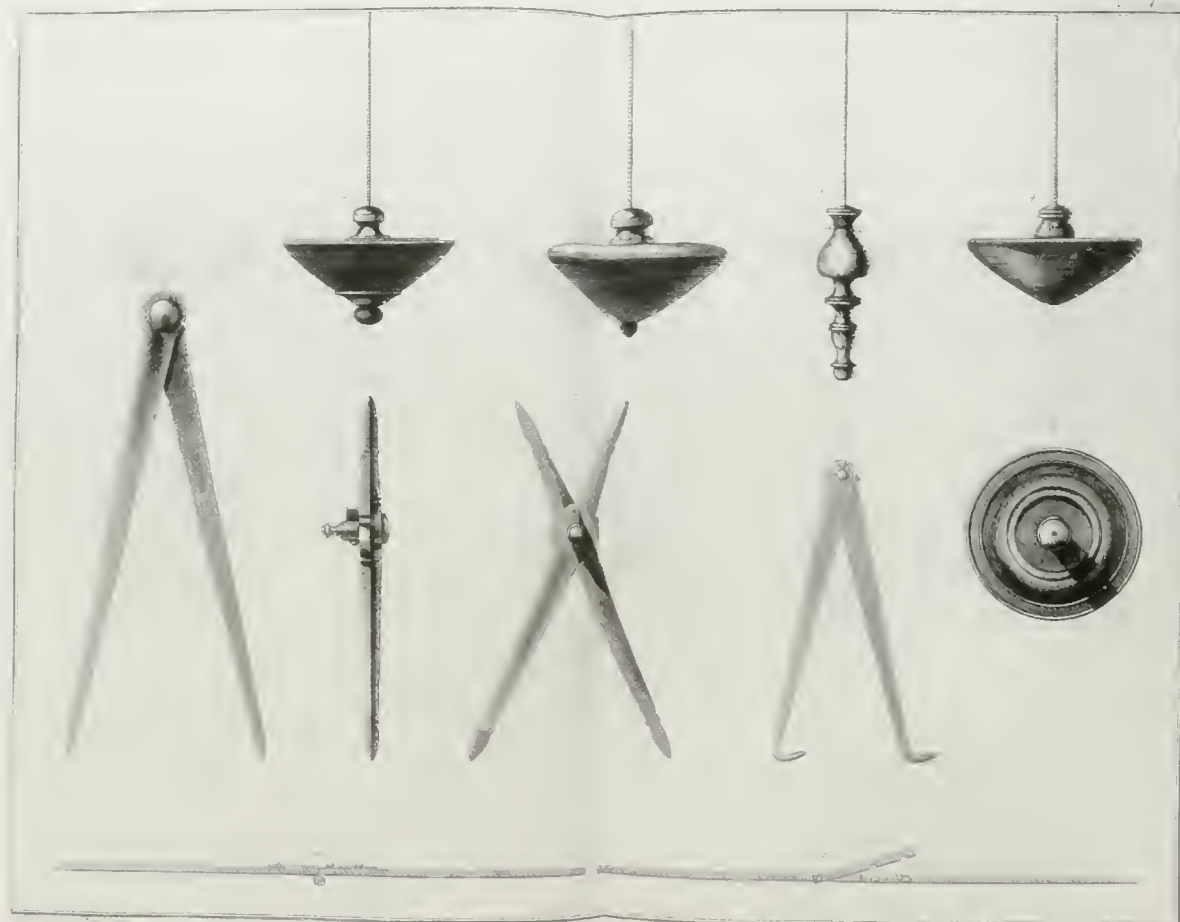
Figure 1 (right). Auguste Denis Fougereux de Bondaroy, plate III from *Recherche sur les ruines d'Herculanum et sur les lumières qui peuvent en résulter relativement à l'état présent des sciences et des arts* (Paris, 1770), collection of the Canadian Centre for Architecture.

certainly fair to say that a dense web of associations was spun around these everyday tools as events unfolded.

In 1807, Francesco Piranesi glorified not the tools of French peasants, but their very similar counterparts from Ancient Pompeii, with his *Usages civils et militaires*.¹⁰ He opened this large catalogue with a *General plan of the Portici Museum, indicating the cabinets containing the objects found in Pompeii and Herculaneum in the year 1770*. The implication here is that the tools and utensils included were more than simple pieces of hardware to be stacked in a barn; they were, indeed, worthy of being kept in the Royal Museum's own dignified setting. In the next pages, Francesco went out of his way, trying to make pots and pans look like so many noble and desirable objects. The

book's unusual range of graphic experiments suggests that the project stretched his wits to the limit.

Finely crafted precision instruments such as compasses and plumb bobs lent themselves well to the technique of catalogue illustration which had become standard—a precise rendering in extremely thin lines, offering a wide range of finely modulated greys, against a white background. (Figure 2) However, more rustic wares could not hold their own so well; a different rendering technique had to be found. Francesco tried grouping plates, pots, pans, and a colander together, attempting to form a more stimulating composition. (Figure 3) He downplayed the rough surfaces by creating a denser range of greys, by using thicker lines, and by setting the objects against an even coarser



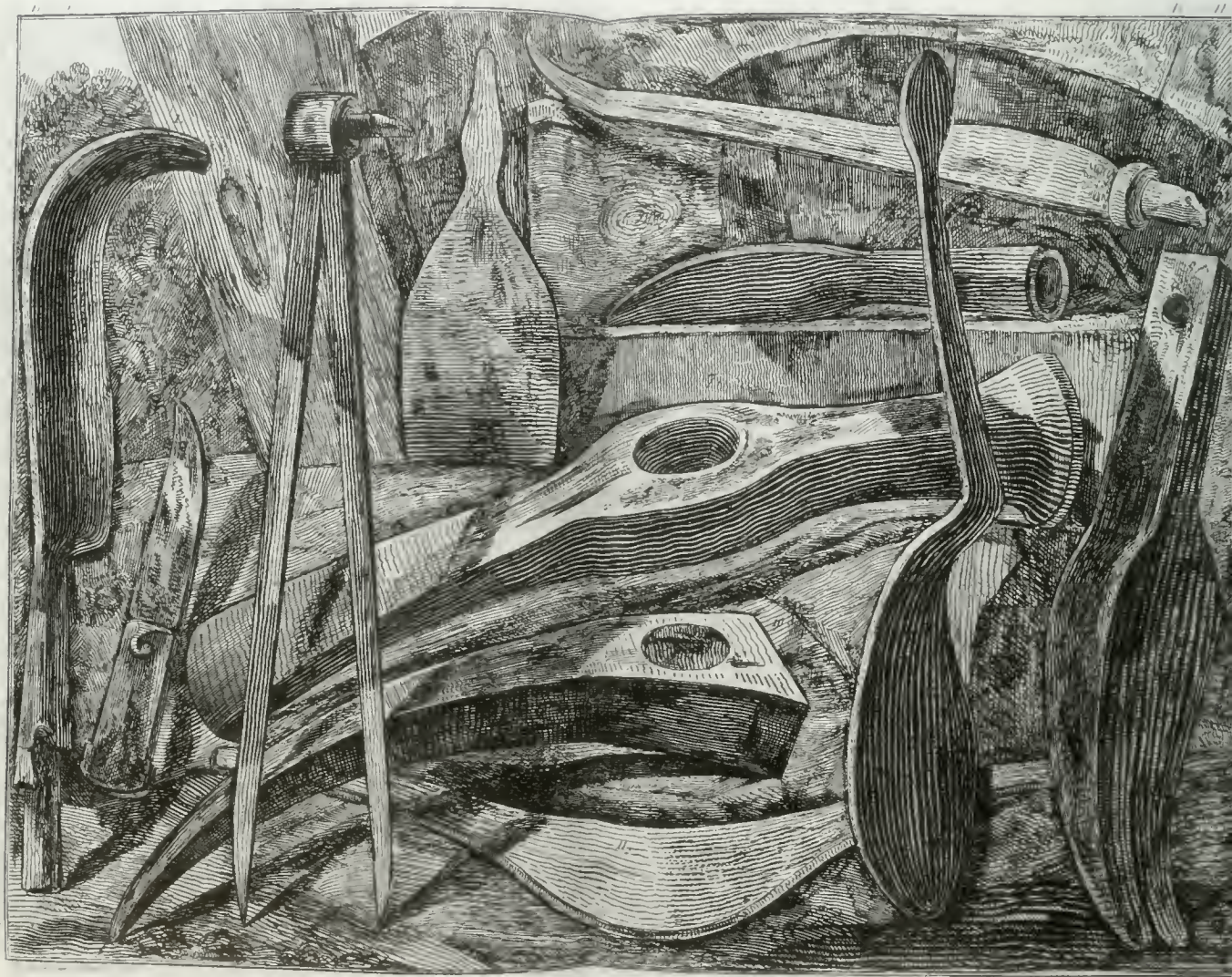
Instrumenti pour la Construction. Batiments trouvés à Pompéii



Armoire contenant des ustensiles de ménage.

Figure 3 (above). Francesco Piranesi, *Armoire contenant des ustensiles de ménage*, plate VIII from *Antiquités de la Grande Grèce, aujourd'hui royaume de Naples, gravées par François Piranesi...*, [Tome III] : Usages Civils et militaires trouvés à Pompéïa et à Herculannum (Paris, 1807), collection of the Canadian Centre for Architecture.

Figure 2 (left). Francesco Piranesi, *Instruments pour les constructions de bâtiments trouvés à Pompéïa*, plate V from *Antiquités de la Grande Grèce, aujourd'hui royaume de Naples, gravées par François Piranesi...*, [Tome III] : Usages Civils et militaires trouvés à Pompéïa et à Herculannum (Paris, 1807), collection of the Canadian Centre for Architecture.



Outils de Maçons et d'Agriculteurs trouvés à Pompéï

Figure 4. Francesco Piranesi, *Outils de Maçons et d'Agriculteurs trouvés à Pompéï*, plate VII from *Antiquités de la Grande Grèce, aujourd'hui royaume de Naples, gravées par François Piranesi...*, [Tome III] : *Usages Civils et militaires trouvés à Pompéï et à Herculannum* (Paris, 1807), collection of the Canadian Centre for Architecture.

background. Finally, Francesco placed the vessels in a cabinet, whose open doors acted as a picture frame.

However, it is unclear whether this piece of furniture is the actual museum cabinet where the Antiques were enshrined, or if it is a plain cupboard where the plates would have been stored in Antiquity. In other words: is this a “normal” cupboard, that positions the objects back into the flow of everyday life, or is it something more special, a museum cabinet, that brackets them away from their context of use? Is this a picture of something normal and soothing, or a view of something, unique and exciting? Is this a real, insider view into the world of cooking, or is it a glimpse at another universe, peopled with kings and collectors? Is this about the servants or the aristocrats? Is it about yesterday or today?

Even more puzzling, are Francesco’s farmers’ and masons’ tools. (Figure 4) Looking at the tools themselves, one could not really tell whether they were eighteenth century versions or their Ancient counterparts; the technology had not changed much over the centuries. Francesco intermingled these overly familiar objects into a dynamic composition, which he further energized by means of bold, temperamental lines running along the length of the instruments. He set this dynamic jumble against a rough background scattered with bricks, pieces of wood and a portion of a tilted field, happily letting the figures and the background mingle with one another—as if the pick were to plunge in the earth in bold, circular strikes. Everything, here, sent the viewer into a space of action—a space of labour, which flowed uninterrupted from Antiquity to the nineteenth century.

One can assume that Francesco’s catalogue *worked* for French audiences, because it didn’t really work as a catalogue—it was so broad, so messy. The artefacts kept flying out of the space of the museum, sometimes they looked special, and sometimes they looked absolutely familiar. They were ancient, they were modern, they belonged to a distant past, and yet they had a tremendous sense of immediacy. It is as if he had set a carnival in motion, borrowing conventions and turning them up on their head, setting them sideways and putting them back up again. Patchy and tentative as it was, Francesco’s book allowed for an extraordinary range of potential interpretations, and this was probably the best way to get a troubled, and uncertain public to finally “discover” the tools and utensils of Herculaneum and Pompeii.

A generation that turned its kingdom into a republic must have missed the glitter of luxury and the sense of historical continuity associated with the old regime, while learning to love the simpler, and more solid pleasures of industry and agriculture. However hybrid and disjointed Francesco’s catalogue might have been, it did reconcile these tensions. It proved that the most ordinary tools from the nineteenth century were the same tools that helped build the foundations of western society, suggesting that these tools were very precious indeed.

The book helped ancient hardware *signify, fit in, and play a role* in the new cultural matrix forming in early nineteenth-century France.

Notes

1. On the reactions of travellers to Herculaneum and Pompeii see Chantal Grell, *Herculaneum et Pompéi dans les lettres des voyageurs français*, Centre Jean-Bérard (Naples, 1982).
2. A few authors mentioned the tools and utensils of Pompeii in their publications, but they often did so in passing, and with an almost dismissive tone. The Abbé Moussinot wrote that "We will not take the time to examine the other curiosities, which consist in spoons, urns, vessels of every size and shape, lamps like candlesticks, different kinds of kitchen utensils, bottles of glass, hammers and door bars, dies to play with, rings, ear-rings, bracelets..." in *Mémoire historique et critique sur la ville souterraine, découverte au pied du Mont-Vésuve...* D'Arthenay (Avignon, 1748). This quote is taken from the English translation, *Memoirs concerning Herculaneum, the subterranean city, lately discovered at the foot of Mount Vesuvius, giving a particular account of the most remarkable buildings, statues, paintings, medals, and other curiosities found there to the present time* (London, 1750) p. 51. Marcello de Venuti broached the issue in a similar passing manner: "I went into a room, the ceiling of which was entirely demolished, and which had probably been the kitchen, by reason of the great quantity of brass and earthen vessels found therein, such as dishes, trivets, and other things too numerous to describe here, and which I did not examine minutely," in *Descrizione delle prime scoperte dell'antica città d'Ercolano: ritrovata vicino a Portici, villa della maestà del re delle due Sicile*, Lorenzo Baseggio (Venezia 1749) p. 109.
3. Auguste Denis Fougereux de Bondaroy, *Recherches sur les ruines d'Herculaneum et sur les lumières qui peuvent en résulter relativement à l'état présent des sciences et des arts; avec un traité sur la fabrique des mosaïques*, De Saint (Paris, 1770).
4. Francesco Piranesi, *Antichità di Roma, ou, aujourd'hui Royaume de Naples, gravées par François Piranesi...*, [Tome III] : Usages Civils et militaires trouvés à Pompéia et à Herculaneum, Établissement des Beaux-Arts et chez Leblanc (Paris, 1807). The book was reprinted by Firmin Didot in 1837.
5. See Chantal Grell, Christian Michel, *Érudits, hommes de lettres et artistes en France au XVIIIe siècle face aux découvertes d'Herculaneum*, in Ercolano 1738-1988, 250 anni di ricerca archeologica, Atti del Convegno Internazionale Ravello-Ercolano-Napoli-Pompeii, 30 ottobre – 5 novembre 1988, a cura di Luisa Franchi dell'Orto, « L'Erma » di Bretschneider (Rome, 1993) and Ferdinando Bologna, *La riscoperta di Ercolano e la cultura artistica del settecento Europeo*, in *Le Antichità di Ercolano*, Banco di Napoli (Naples, 1988).
6. Pierre Hugues d'Hancarville, *Antichités étrusques, grecques, et romaines tirées du cabinet de M. William Hamilton*, printed by F. Morelli (Naples, 1766-1767).
7. Jean Claude Richard de Saint Non, *Voyage Pittoresque, ou, Description des royaumes de Naples et de Sicile*, Imprimerie de Clousier (Paris, 1781-1782).
8. Auguste Denis Fougereux de Bondaroy, "Art de tirer des carrières la pierre d'ardoise, de la fendre et de la tailler," (Paris, 1762) a stand-alone entry in the *Description des arts et métiers, faites ou approuvées par Messieurs de l'Académie des sciences de Paris* (Paris, 1762). and Auguste Denis Fougereux de Bondaroy, "Art de travailler les cuirs dorés ou argentés," in Diderot and Le Rond d'Alembert, *Encyclopédie du cuir doré* (Paris, 1762).
9. Bondaroy, 1770 op. cit., p. 46.
10. Bondaroy, 1770 op. cit., p. 111.
11. Ferdinando Bologna, op. cit., pp. 83-105.
12. Abbé Barthélémy: *Le Voyage du Jeune Anachorsis en Grèce, dans le milieu du quatrième siècle avant l'ère vulgaire*, De Bure l'Ainé (Paris, 1791) The first edition appeared in 1788.
13. Abbé Barthélémy, op. cit., p. 166.
14. Mona Ozouf, *La fête révolutionnaire, 1789-1799*, Bibliothèque des Histoires, Éditions Gallimard (Paris 1976) p. 65.
15. Michelet, *Histoire de la révolution française*, Robert Laffont (Paris, 1979) p. 37.
16. Michelet, op. cit., p. 185.
17. Michelet, op. cit., p. 150.
18. Michelet, op. cit., p. 241.
19. The story of the making of this book can be found in Agnès Allroggen-Bedel, *Piranesi e l'archeologia nel reame di Napoli*, in Piranesi e la cultura antiquaria del suo tempo. Gli antecedenti e il contesto. Atti del Convegno 14-17 nov. 1979. (Roma, 1983) pp. 281-291. in *Researches in Campanian Archaeology, Corpus Topographicum Pompeianum* (Rome, 1981) pp. 181-188, and in Giuseppe Pucci, *L'antiquaria e il suo doppio: a proposito di Francesco Piranesi*, in *Prospettiva* N. 16, January 1979, pp. 67-73.

Chris Csikszentmihályi

Afghan Explorer

In the First Amendment, the Founding Fathers gave the free press the protection it must have to fulfill its essential role in our democracy. The press was to serve the governed, not the governors.

The Government's power to censor the press was abolished so that the press would remain forever free to censure the Government. The press was protected so that it could bare the secrets of government and inform the people. [...]

And paramount among the responsibilities of a free press is the duty to prevent any part of the Government from deceiving the people and sending them off to distant lands to die of foreign fevers and foreign shot and shell.

Supreme Court Justice Hugo Black
New York Times Co. vs. United States
1971, 6-3 Majority Opinion

Problem:

Since the early 1990s, the United States has disallowed field journalists in war zones. This means that taxpaying US citizens have little idea what is happening to their soldiers paid for with their own tax dollars.

Solution:

A tele-operated, robotic war reporting system, able to provide images, sound, and interviews in real time.

Abstract:

The Afghan Explorer is a semi-autonomous, mobile robot that can practice elements of journalistic reportage in hostile, off-limits environments. The Explorer is:

- a powerful robotic "stringer," a homage to the bravery of war reporters in the past.
- a prototype personal information gathering system, allowing individuals to decide what qualifies as news.
- a reminder that wars should not be an exception to the freedom of the press, an inalienable human right described in the bill of rights. Freedom of the press should know no borders; thus the Explorer is a technology that knows no borders.

Enabled by global wireless technology, solar power, and sophisticated computing, the Explorer is able to navigate both urban and rural terrains. Its unique combination of hardware and software allows it to gather video, image, sound, conduct two-way interviews, and interact with local populations, even in areas deemed off-limits by the local and US military authorities.

Afghan Explorer is comprised of a remote, tele-operated robot, a high-speed digital data link viewable over the Web, and a Cambridge-based operations center.

WHY:

Afghan Explorer is intended as a vehicle for personal knowledge acquisition, in the belief that international peace can only come from mutual understanding. As the most powerful, and arguably the most technologically advanced nation in the world, it seems as if Americans should be able to get information at any time, from any place.

Economics of Scale

In fact, Americans are often information poor. Their reliance on low-content mass media, like USA TODAY and television news, means that they see relatively little news and commentary, usually written for a 7th grade literacy level.

In contrast to European nations, our geographic isolation means that we seldom learn foreign languages, and rarely meet people from other countries. Isolation once meant an isolationist foreign policy, but increasingly we find ourselves "peace-keeping," or at war with people and regions we have barely heard of. Without an active and unrestrained media, how can we, the people, decide if our elected representatives are acting in our interest?

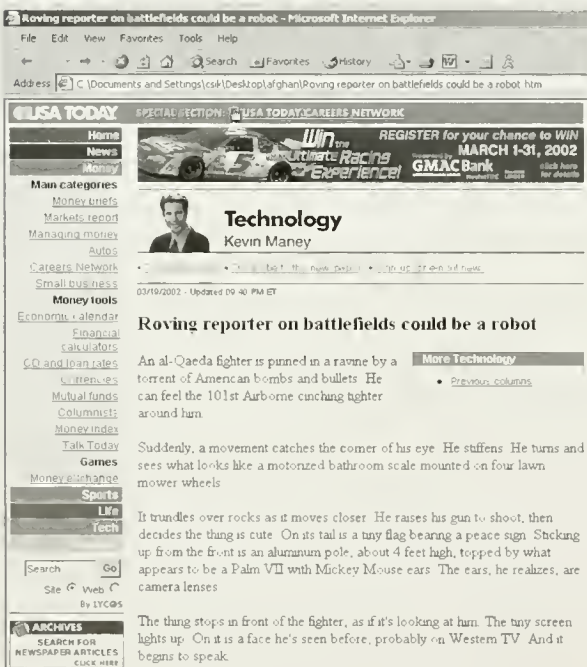


Figure 1

Alien Reporting

Really, our only hope is for an aggressive media, which can help to tell us what is going on, both in peace time and in war. But since the Persian Gulf War, US reporters are disallowed from freely covering events. In Vietnam, for instance, journalists had self-imposed rules for how to protect our servicemen and operations from potential security breaches.

In the ten years of the Indochina conflict, out of several thousand US correspondents, none had accreditation revoked for violating these rules, which the US Military also approved. But during Desert Storm, reporters had to have military escorts wherever they went, escorts who routinely would interrupt interviews if a soldier strayed from the official line. Dispatches, still photographs, and video footage were subject to military censorship. Reporters operating outside the so-called pool system for wire services, newspapers, and networks were subject to military arrest.¹

War without Witnesses

Obviously the security of our troops is important, indeed, essential. But so is making sure that the US involvement is appropriate, measured, and humane. Yet Afghanistan is so far away, and our information about it so one-sided, that it is almost invisible. In fact, it is about as conceptually remote as Mars, yet teeming with intelligent life.

The US can send autonomous robots to the reaches of space, so why can we not do the same for geopolitical hotspots?

Experience has shown again and again that an informed, aroused public is the best disciplinarian of power, public, or private. That is why it is so worrisome to see the obstacles that the Pentagon is placing now in the way of direct, on-the-scene news coverage of the war on terrorism.

A Technology for Peace

The Afghan Explorer is a technology to help international understanding. By allowing US citizens to be virtually present in the stunning natural beauty of Afghanistan, and to remotely sense its ancient history and diverse people, we can only help the current situation. And likewise, by allowing the Afghani people to get a sense of who we are - not a Great Satan, but rather a peaceful, freedom-loving people - we can only be paving the way for peace and reconciliation.

nan Explorer

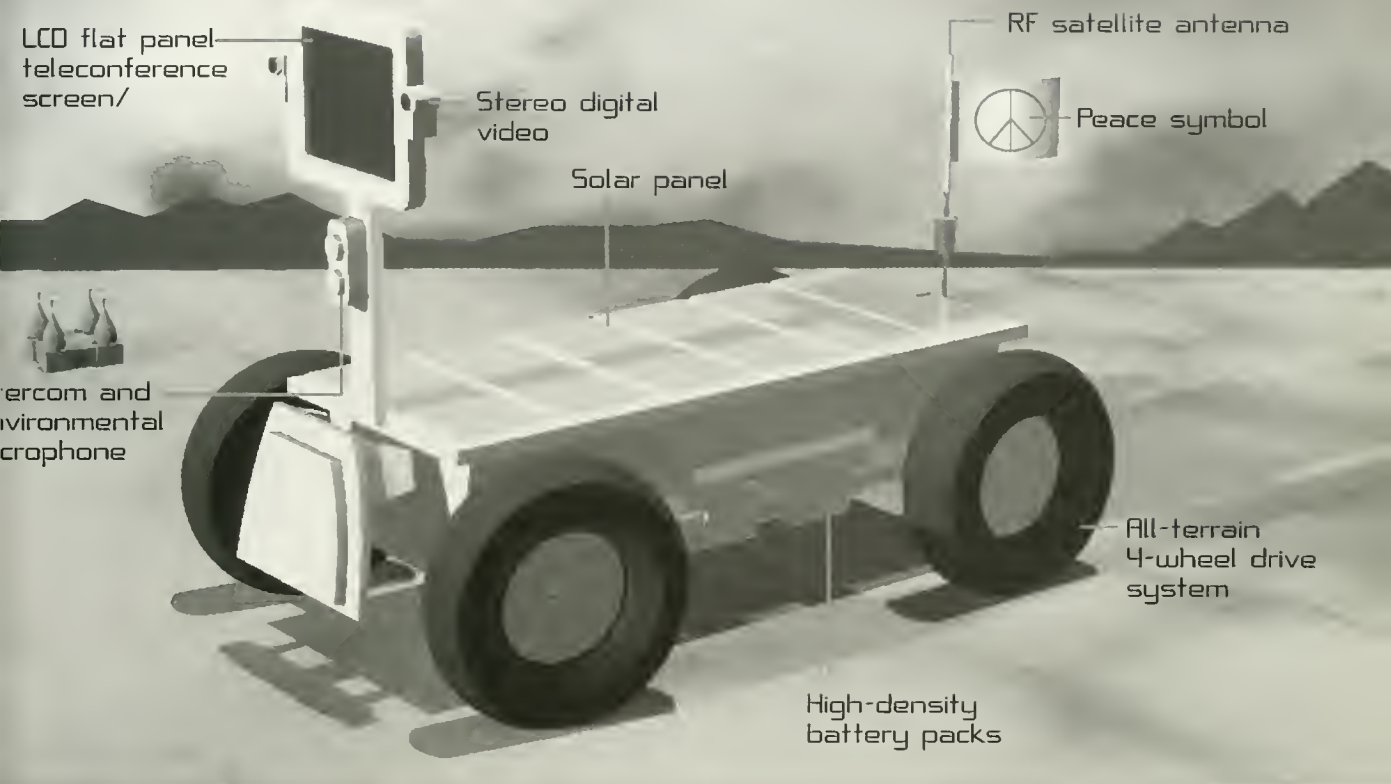


Figure 2

WHAT:

Robotic Rover Component

The telepresence unit is a dog-sized, semi-autonomous robot. It is solar powered, able to cover rough terrain, and can operate nearly anywhere in the world. (Figure 2)

The drive system consists of four wheels, driven by electric motors, running through a proportional-integral-derivative drive system. Sensors include: an electronic compass and GPS unit for gross navigation; a host of rangefinders; bump, shock, and balance sensors for local navigation; stereo video cameras for both interviewing and teleoperation; microphones for interviewing and sound recording

The "brain" of the system is a common laptop, while communications are facilitated with an off-the-shelf global mobile phone. The cell phone allows for both a direct Internet connection and a bidirectional voice channel.

Mission Control

Back at the lab, we will be teleoperating the robot at our 24/7 operations center. Dari and Pashto interpreters will be on call to aid in translating interviews. (Figure 3)

The main interface to the robot will be a 10kbps data link, which will be mirrored on this site. We will also keep an archive of photos, digital audio, and video clips gathered by the remote system. Information will be posted to the web, provided it presents no possible threat to any participants in the war.

WHERE:

From New England to Central Asia

Our mission is to cross the surface of Afghanistan, from east to west, stopping to explore areas of local interest, photograph events as they happen, and conduct interviews with people along the way.

Successfully navigating Afghanistan will depend on our GPS-based guidance system, but we also expect to rely on the good will and assistance of local citizens and members of the US Armed Forces. We will stop often for directions and to discuss issues.

HOW:

The Explorer draws on the years of knowledge and experience generated from research into unmanned space exploration. In many ways, it is similar to an interplanetary probe, or a planetary "rover." The technical problem is significantly simpler than those NASA confronts, because the environment is far less hostile. Components of our system, assuming it is covering a conventional battle, do not need to be "rad-hard," radiation proof. The Explorer faces far more serious threats, however, from hostile humans on all sides of the conflict.

The best technique for unmanned space exploration has proven to be a combination of autonomous control (where the robot makes “intelligent” decisions based on its “knowledge” of its situation and environment) and tele-operation (where crews in the “mission control” make decisions, and then remotely control the robot). Remarkable advances in sensor systems have radically increased the amount of information a robot can acquire about its situation, while off-the-shelf communications technologies allow teleoperated robots to be built for a fraction of the price they once commanded.

One example of how designing for Intraplanetary exploration is significantly simpler than Interplanetary systems is that information travels much faster from one side of the Earth to another than it does between planets. It can take minutes for radio information to travel from Mars to Earth, which is too long if the message is "I'm rolling towards the edge of a cliff!" Lag time in our system is expected to be less than 1000 milliseconds.

Likewise, lifting a payload into orbit is incredibly expensive, and serves as perhaps the largest single constraint in the design of space-bound vehicles. For instance, the original Space Shuttle had only 36K words of fixed memory, and 2K words of erasable memory! Our system can use a conventional laptop with many gigabytes of storage, able to handle digital video and audio recording, as well as the control and communications programs.

Major Subsystems

As can be seen above, the Explorer relies on a combination of advanced technologies and off-the-shelf consumer hardware. The system can be parsed into four main functional units: Sensors, Drive & Power, and Reportage.

Reportage: The reportage system miniaturizes many of the common elements of an ENG (Electronic News Gathering) system. Its main input components are, digital video cameras, able to shoot in a wide range of lighting conditions, digital audio recording, intercom system for remote interviews.

This information, as well as text and numeric information generated by the robot, is compressed and sent via a two-way voice/data satellite uplink. Information from the mission control may be sent back to the robot, either voice information or picture information, which can then be played through the speaker system or displayed on a ruggedized LCD screen, respectively.

Sensors: The robot is partially aware of its environment, using accelerometers, inclinometers, thermometers, IR reflective

distance sensors, and the stereo video cameras to get a sense of its immediate physical situation. For navigation, the robot relies on a Global Positioning unit, electronic compass, and the video cameras. These electronic systems, when combined with the human operator's intelligence and the sensors, allow the robot to navigate in almost any situation accessible to a walking human. (Figure 4)

Drive and Power: The power system is solar charged, allowing the robot to function on cloudy winter days at a 60% duty cycle. In other words, the robot may explore the country for 2/3 of the daytime. The other daylight and evening hours it can "rest," do interviews, or process information. The drive system is a 4-wheel, all-wheel drive, using high torque electric servo motors. The motors are computer-controlled, allowing for maximum efficiency and delicate maneuvers. The tires are puncture-proof and may be refilled at any standard service station.

The Afghan Explorer is a unique combination of enabling technologies at a remarkably affordable price.

Notes

1. Patrick J. Sloyan, "The Real War," *Media Studies Journal*, Vol. 15, No. 1, Summer 2001. Arlington, VA.



Figure 4

Prodromos Nikiforidis, Bernard Cuomo, Paraskevi Tarani

A la Recherche du Temps Perdu

Introduction

In an historical city, we discover successive layers of time which coexist without one taking account of the other. "Parallel cities" raise barriers to each other, come into conflict, or mutually ignore each other since each seeks the present-day, real space. (Figure 1) In the centers of many Greek cities, with high levels of urban density, large open spaces frequently coincide with archeological excavations and archeological ruins which have remained amid the dense urban mass. This paper presents a project carried out by the authors at an archeological site in Thessaloniki where the issues of its coexistence with the modern city were the major concern.

The Problem of Interpreting 'Historical Place'

The greatest difficulty in comprehending and interpreting the meaning of "topos" lies in the fact that it contains the concept of time concealed. A place accumulates ruins, symbols, languages, and living memories; it is never the same and thus cannot be subjected to easy typological analysis. One can view a place as a museum preserving all human actions over the course of time.

Reading Michel Foucault, who included the museum and cemetery within his list of heterotopic places, we could say that archeological sites are heterotopic places par excellence, or – especially those located in the historical city centers. An archeological site within the modern urban fabric retains its function as enclosure, as *Abaton*, interrupting the continuity and uniformity of a modern city. The historical city emerges from the past, and its traces are preserved within existing modern structures. This process of development creates a fragmentation of time, a crack in the secession of urban events, a discontinuous system.

In *The Architecture and the City* (1966), Aldo Rossi sought the uniqueness of each urban structure, the "locus solus," among a crowd of disparate uses, transformations events, and symbols, through the course of the city's historical time. For Rossi, the city is the collective memory of its citizens. In this sense, collective memory becomes a thread passing through the entire

complex structure of the city, just as memory runs through the entire life of a person.¹

The idea of city, recorded in the collective subconscious, was also dealt with by M. Christine Boyer, many years later and from a different perspective in her book *The City of Collective Memory* (1994).² She claims that the post-modern visualization of space and time exploits history and fragments of the past to build a romantic, misleading perception of the city. Boyer seeks a unifying thread in these fragments of the past to form, "...a continuous urban topography, a spatial structure that covers both rich and poor places, honorific and humble monuments, permanent and ephemeral forms, and should include places for public assemblage and public debate, as well as private memory walks and personal retreats."³

The restoration of the monumental or symbolic reading of the city, in addition to its direct applications to the cultural – tourist economy, also includes a series of "heavyweight" issues, political and ideological in character, which in turn lead to divergent interpretations and conflicts.³ Moreover, the process of conserving and protecting them, entails special and material "sacrifices" for the modern city, which central government or the local community are called upon to make.

Intervening in Archeological Sites within the Urban Fabric

The layout of archeological sites as public spaces integrated into the functional continuity of the city is a modern architectural problems which contains many complicated issues in need of resolution. It requires a major debate about the interpretation and characteristics of archeological sites and touches upon the substance of planning: integration into the modern urban fabric and utilization to create special public uses or fencing off as scattered museum-like interstices.

Intervening in archeological sites and breaking an historical prohibition makes sense to the extent that it raises the problem of the continuity of the city, a continuity capable of transcend-



Figure 1. General View

ing the contrast between Old and New. Archeological sites, located within modern, vibrant cities, should not be dealt with only in terms of “protection” but also in terms of “integration” into modern social, functional, and cultural events occurring within the city surrounding them. The process of integration is the only one which can stem their degradation and gradual abandonment, and convert them into living organisms and not simply well maintained sights. Of course, this presupposes the development of a new view of what the concept of “historical” object means. “Restricting an object to a museum of itself is not a practice which can be extended to an entire city,” says Manfredo Tafuri.⁴

Integrating archeological sites into the continuity of the urban fabric, of course, does not entail a negation of the features of those archeological sites as elements in the discovery and exploration of a different place, a negation of their heterotopic identity.

The monuments in the historical center of Thessaloniki and the ruins in their diverse historical stratification directly coexist with the modern urban fabric. Existing spatial relationships between the modern city and the monuments or archeological “interstices” are relationships based on familiarity and directness, but their coexistence is not always harmonious. The monuments of Thessaloniki function as breathers within the urban fabric, provoking a change of scale, human communication and the unexpected discovery of a different environment. Varying symbolisms are at play in urban and social spaces surrounding the monuments of a city: worship, leisure, communication. This fact generates an extremely significant and interesting diversity in the modern urban environment and brings relief from its “esthetic burden.”

Redesigning of the Aristotelous Monumental Axis 1st Prize - International Architectural Competition, 1997

The Aristotelous Civic Axis is a succession of public, open spaces leading from the sea front to the Old City, a transverse cut in the otherwise longitudinal layout of the city. Our plan highlights its interesting topography and unifies the high point of the city with the sea. (Figure 2)

The Aristotelous Monumental Axis came into being as a conscious design gesture after the historic centre was destroyed by the fire of 1917. Preparation of the new plan for Thessaloniki was assigned to an international commission led by Ernest Hébrard, director of the French Military Archeological Service in Thessaloniki. The implementation of the monumental axis in the section south of Egnatia Street began uneventfully. However, numerous problems emerged in the other sections. Indications regarding the existence of major archeological finds in the section intended to become the “administrative square” provoked intense reactions about implementing the plan. An

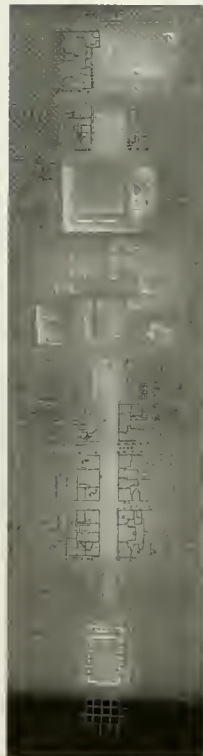


Figure 2. Master Plan

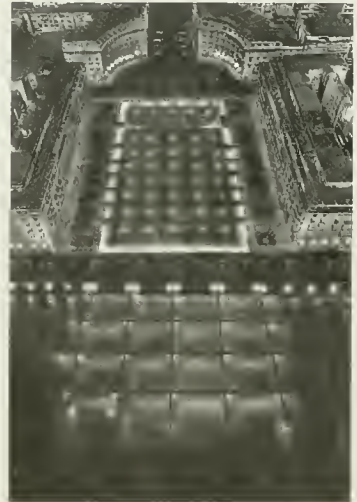


Figure 3. Aristotle Square

international architectural contest in 1924 for the City Hall Building remained on paper since the archeologists insisted on carrying out excavations before any work began. The outbreak of World War II and the German occupation suspended all relevant activities. In the post-war period, during the mid-1950s the areas intended for the stepped gardens in the higher reaches of the axis were rebuilt blocking the view to the old city. In 1956, in order to begin work on the Court Building, excavations needed to be carried out in the area. They eventually commenced in 1962 and brought to light the city's Ancient Agora, a *forum romanum*. Despite the obvious significance of the ruins uncovered, pressure for the erection of the Court Building was intense. However, the reactions by archeologists, the press, and the city's intellectual circles were equally intense. As a result, in 1970 the Courts were eventually being built elsewhere in the city. In 1989 the first restoration works on the Agora commenced, but no effort was made to redesign the monumental axis until the International Architectural Competition was announced in 1997.

All the events surrounding implementation of the Aristotelous Civic Axis and the difficulties of the original plan clearly indicate a "problem" of historical cities coexisting with multiple strata of development, when the old is revealed to be negating the creation of the new. Our proposal was based on this premise, and responded with a new interpretation about the modern dynamic of the axis which could be based on diversity. Our concerns led us to propose design interventions that place emphasis on the stratification and successive layers of the city, so that all are readable, and yet coexist and contribute to the creation of a modern urban web of public spaces for the city. Using the square grid as a design tool – like the one used in excavations – our proposal attempted to activate a valuable fabric of fine historical and local references along the entire length of the axis. It sought out urban harmonies which preserve deep resonances in collective memory so as to highlight the axis's present-day role as the historical and central public space in the city. (Figures 3-6)

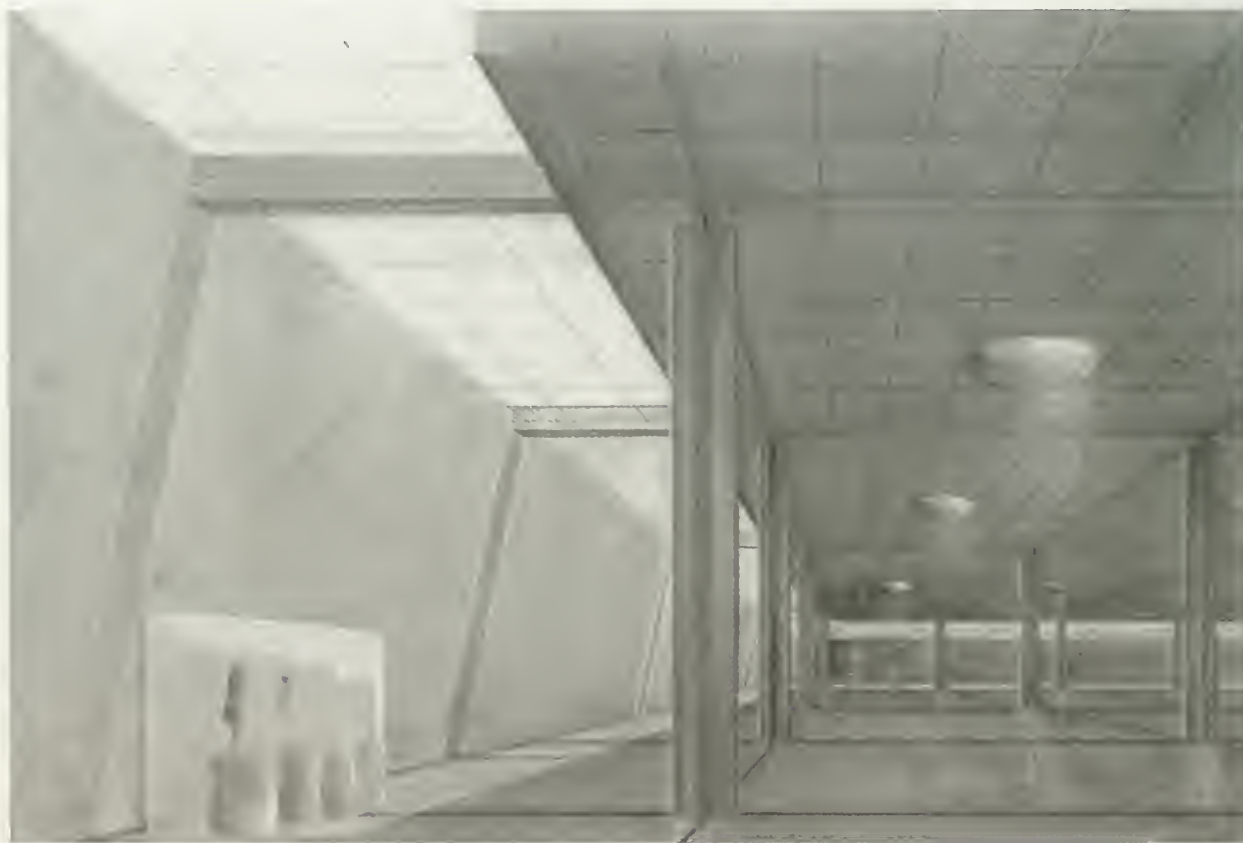


Figure 4. Under the Square

Notes

1. Aldo Rossi, *L'architettura della città*, Marsilio Editore, Padua, 1966.
2. M. Christine Boyer, *The City of Collective Memory – Its Historical Imagery and Architectural Entertainments*, MIT Press, Cambridge, 1994
3. *ibid.*
3. Argyro Loukaki, "Greece: Ancient Ruins, Value Conflicts and Aspects of Development" Ph.D. Diss, Oxford University, 1994.
4. Manfredo Tafuri "History, Conservation, Renovation" interview given to C. Baglione & B. Pedretti, *Casabella Journal*, No. 580, 1991.



Figure 5. Park

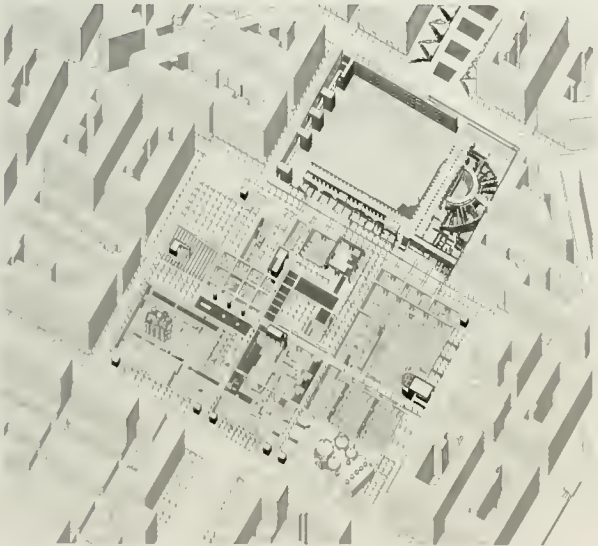


Figure 6. Forum

horizons

martin hogue

This is a trip I'd wanted to take for a long time.

What began as a simple exercise of locating on a map a series of earthworks and related projects which had played a critical part in the development of my thinking about architecture and landscape later turned into a month-long, 10,000 mile trek across the United States and Canada in the summer of 2000. What had originally attracted me to the works of Michael Heizer and Nancy Holt, among others, was the potential for meaningful connections with the earth and the sky. A journey of my own appeared necessary as well.

There is a place which never leaves the eye throughout the entire trip: the space of the horizon, the boundary between the earth and the sky, the measurable and the immeasurable. The horizon operates as a datum distinguishing between 2 parallel journeys: on the first hand, the rigors of everyday travel, of driving and constant displacement, of packing and unpacking, symbolized by the earth and the downward pull of gravity; on the other hand, the opportunity for intense moments of reflection, joy and wonder: a meditative journey, represented in the sky.

The following is an edited account of this journey, as well as later trips to earthworks which had not been originally visited. Extensive documentation of various kinds were produced during the course of each trip. This folio constitutes the beginning of an effort to consolidate this information into a cohesive format. The scales at the bottom of each page attempt to frame the trip in terms of concrete, earthly dimensions: events, time and place.

0

2,000

vietnam veterans memorial
washington, d.c.
june 13
659 miles

earthworks: distance

effigi tumuli
ottawa, il
june 26
3,688 miles

mount
black t
june 2
4,850



sun tunnels
lucin, ut
july 01
5,878 miles

double negative
overton, nv
july 03
6,799 miles

7,000
hoover dam
nv / az border
july 04
6,909 miles

very large array
magdalena, nm
july 06
7,755 miles

lightning field
quemado, nm
july 07-08
8,148 miles

chinati foundation
marfa, tx
july 09
8,639 miles

9,947 miles



6.11

6.18

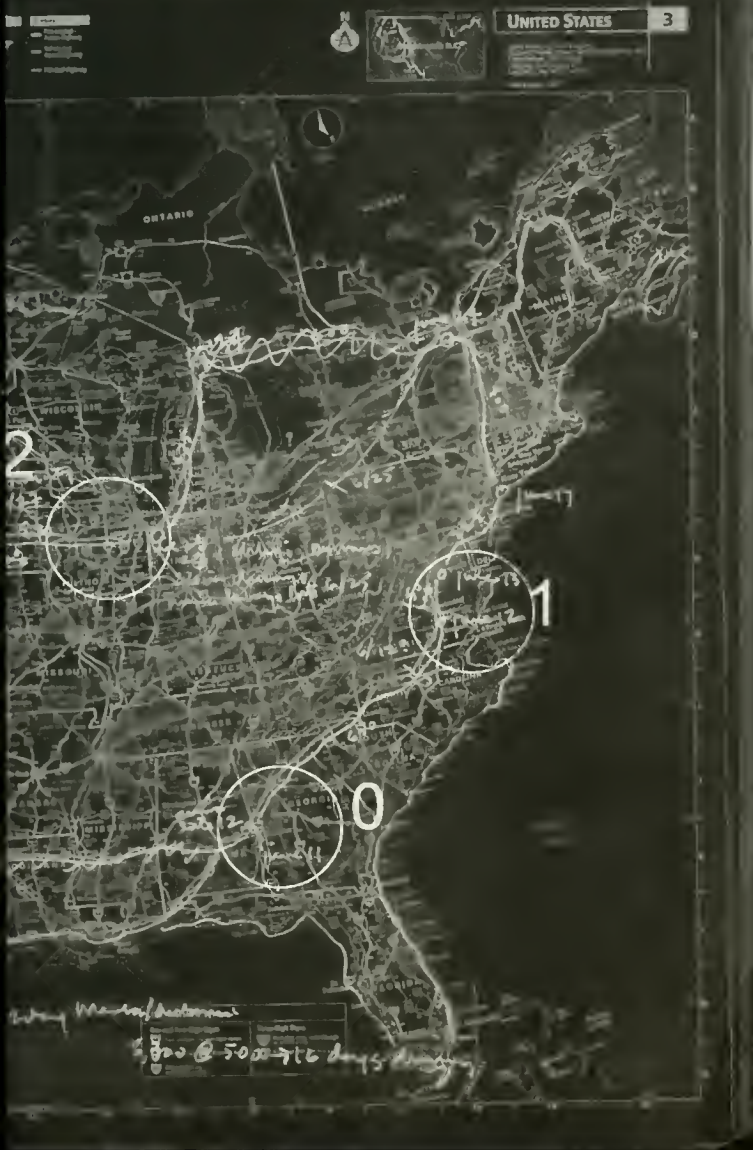
6

0. home

1. vietnam veterans memorial
(maya lin)
washington, d.c.
june 13-14

earthworks time

auburn, al
june 11



7 02

7 09

7 10

umuli
heizer)

3. mount rushmore
(gutson borglum)
black hills, sd
june 29

4. sun tunnels
(nancy holt)
lucin, ut
july 01

5. double negative
(michael heizer)
overton, nv
july 03

6. hoover dam
nv / az border
july 04

7. very large array
magdalena, nm
july 06

8. lightning field
(walter de maria)
quemado, nm
july 07-08

9. chinati foundation
(donald judo)
marfa, tx
july 09

Many earthworks are located far away from any human settlement. There are no road signs leading to them, only cryptic maps and directions. The extraordinary feeling of reaching the Sun Tunnels after several miles on a dirt road, of seeing the site in the distance, following moments of doubt and uncertainty, is something not soon to be forgotten.





7.02

7.09

sun tunnels
lucin, ut
july 01
1:58pm
5,878 miles

c a r : m a i n t e n a n c e

For all the joys of reaching a destination, there is a rigor to travel. The opportunity to forget about the pull of gravity, the long miles, the hotels, the campgrounds, the airports, the



1,000

4,000

shaft
montreal, qc
june 20

expos baseball
montreal, qc
june 21

road trip
erie, pa
june 24

white sox baseball
chicago, il
june 25

gone in 60 seconds
iowa city, ia
june 26



7,000

9,000 miles

the perfect storm
salt lake city, ut
july 01

me, myself and irene
las vegas, nv
july 03

e n t e r t a i n m e n t

It also has been a hidden secret as to completing the original 10,000 mile journey, Robert Smithson's Spiral Jetty (under water) and James Turrell's Roden Crater (under a desert sky) were a real link off the map.

It took only three full days of darkness extended to see these 2 sites, thus closing the loop on the original journey.



2001

2002

june / july 2000
original road trip

may 2001
visit to roden crater
(james turrell)
flagstaff, az

l o n g i n g



2003

july 2002
attempted visit to spiral jetty (under water)

august 2003
spiral jetty
(robert smithson)
rozel point, great salt lake, ut

Lisa L. Hsieh

Urban Sleeper

Thousands of new units are still needed and will eventually be built, but New York never quite catches up with itself, is never in equilibrium.¹

It will never be in equilibrium however many units we add, because this is a question of topological creation, not algebraic construction, of mapping, not grouping, and of chance, not purpose. Therefore, we must forget Algebra and think Topology.

The objective here is to solve the infamous inequality using topological theories:

Housing demand > housing supply in New York City.²

We will target at a specific group to whom the conventional housing solution—domestic functions contained in a single volume—does not cater to their living needs; then create a new habitat with minimal building by mapping domestic functions to existing public programs. In mathematics terminology the problem we aim to solve can be stated as:

Let $G = \{(x, y, z) | x \in (5\text{th avenue}, 6\text{th avenue}), y \in (8\text{th street}, 14\text{th street}), z \in \mathbb{R}\}$ be a subset of Greenwich Village in New York City; and let X_i denotes the housing unit for city-nomad number i , for $i = 1, 2, \dots, n$. Show that there exist a topological space (an urban home) X in G and a covering map $f: \cup X_i \rightarrow X$ such that $\cup X_i$ is an n -fold covering of X .

The related concepts, definitions, and terminology concerning the proof, along with some useful examples will be introduced as we proceed to solve the problem. To begin, we need to define “topology.”

Topology, in mathematics, is a branch concerned with the study of topological spaces. It deals with geometric problems that depend not on the exact shapes or measurements, but rather on the “relations” of the geometric objects in consideration.

Definition 1.1: A *topology* on a set X is a collection T of subsets of X having the following properties:

- (1) O and X are in T
- (2) The union of the elements of any sub-collection of T is in T
- (3) The intersection of the elements of any finite sub-collection of T is in T

A set X for which a topology T has been specified is called a *topological space*; a subset U of X that belongs to the collection of T is called an *open set* of X .³

Example 1.2: Let X be a five-element set, $X = \{a, b, c, d, e\}$. Figure 1 shows schematically some of the possible topologies on X . For example, the diagram in the upper right-hand corner indicates the topology with open sets $O, X, \{b\}$, and $\{b, c\}$.

Figure 1



But not every collection of subsets of X is a topology on X . For example, none of the collection indicated in Figure 2 is a topology.

Figure 2



Example 1.3: Let $X = \{a, b, c, d, e\}$. The collection of all subsets of X is a topology on X . It is called the *discrete topology* and can be generated by the collection of a, b, c, d , and e .

Before we start to construct the topological space X for an urban home, we should identify our targeted group — the city-nomads, and to do so we will need *Urban Trilogy*.

Theorem 1.4: (Urban Trilogy: in-between living, in-between program, in-between space):⁴

In-between living: There exists a new, yet unclassified group in New York City. Members of this group are often mistaken for wanderers. They move about from place to place and are everywhere in the city. Some, you can find, at the Laundromat. They sit shoulder to shoulder in a row, staring at the spinning machines with lost looks on their faces and detergent bottles on their laps. Some at the sports club; where they train, spa, shop, eat, and shower. Still some at the deli or at the local bar. In hunger they come out to search for grazing lands. All share one common nemesis: everyone is frustrated with his or her expensive, dysfunctional apartment, to which one only returns reluctantly at a day's end to go to sleep.

In a dense environment like New York City, an affordable apartment is, almost without exception, an undesirable one. Domestic functions are not suitably contained in its single volume, and thus its inhabitants are forced to become city-nomads. They wander endlessly from one stop to the next, obscuring the meaning and function of a home.

Let X_i be a typical housing unit for city-nomad number i , such that $X_i = \{a_i, b_i, c_i, d_i, e_i\}$, where a_i = living room, b_i = kitchen/dining room, c_i = bathroom, d_i = laundry room, and e_i = bedroom.

$X_1 = \{a_1, b_1, c_1, d_1, e_1\}$,

$X_2 = \{a_2, b_2, c_2, d_2, e_2\}$,

...

$X_n = \{a_n, b_n, c_n, d_n, e_n\}$.

Assume discrete topology on all X_i , for $i = 1, \dots, n$.

In-between program: However undesirable and untenable the state of an apartment, by no means is its rent reasonable. Money alone isn't enough; it could get you a lease. But to actually live in one you would also need extraordinary imagination. That you could see a dinning nook (a hole in the wall), an open kitchen (an aged stove), a modern bath (a faucet and a toilet), and a luxurious living area (a small single room) in a studio apartment. Besides, you would be willing to compress all life into this small box. Nonetheless, human body and mind aren't engineered that way--most of us rather live in reality. In the end we join the group running around outside with laundry baskets; lingering at the coffeehouse to read newspapers, serve Internet, sort mails, balance checks... City-nomads are all over the city but home.

In-between living undermines the binary of the private and the public and brings about a new urban phenomenon--private ac-

tivities rendered in public spaces. Certain public programs are endowed with a twofold meaning: while a coffeehouse remains a coffeehouse for some, it is a living room for others. Likewise, a health club is an urban-bathroom; a laundromat, an urban-laundry room; restaurants, urban-dining rooms. One would not have to stay and pay outrageous rent for an undesirable apartment if it were not for the one missing piece: the urban-bedroom.

Let X denote an urban-home for in-between living.

We assert that there exist

a = coffeehouse = urban living room,

b = restaurant = urban dining room,

c = health club = urban bathroom,

d = laundromat = urban laundry room,

e = urban bedroom,

such that $X = \{a, b, c, d, e\}$ is contained in G . Assume discrete topology on X .

In-between space: Despite of the absurd small living, when zoomed out, the city with its planned toponymy — a dominant grid formed by blocks and streets -- appears orderly and rational. However, the order and rationality gradually disappear when being scrutinized closer and closer. Zoomed in halfway, the blocks are no longer a well-defined space but an illogical concentration of built structures, nearly to its saturation point. Though full, it seems, there is in some an overlooked space; an unearthed secret awaits to be disclosed.

Along the tree-lined streets in Greenwich Village is a delightful mixture of architectural styles, ranging from Federal, Gothic Revival, Queen Anne, to French Second Empire and more. These buildings share many of the same architectural language—symmetrical window placement, bond brickwork or brownstone, low building heights—and they live in harmony. Circle around a block, you could encounter a cross-section of different styles without noticing where the changes occur. All you would see are the aligned beautiful facades that define the edges of the block.

While the beautiful front facades are being marveled at, the back facades, if any, forgotten. Beyond the front surface is a mystery belonged to the few living in the buildings. Is the block full, completely occupied by buildings, or is there a central courtyard? Do the back facades align like the front, or do they jog abruptly? In fact it is in these questions that lies the unearthed secret: the in-between zone (the urban room,) enclosed and defined by buildings (the inhabitable poché) along the grid streets. (Figure 3)

To construct an urban home X and to ensure that every elements of X falls in G , we need a programmatic analysis on $G = \{(x, y, z) \mid x \in (5\text{th avenue, } 6\text{th avenue}), y \in (8\text{th street, } 14\text{th street}), z \in \mathbb{R}\}$. By definition, G is the area horizontally defined by



Figure 3

By definition, G is the area horizontally defined by streets (from 8th to 14th street, East/West) and vertically by avenues (5th and 6th Avenue, North/South). Each city block is composed of buildings (the solid, the inhabitable poche) along the grid of streets and of empty space (the void, the urban room) enclosed by buildings. In Figure 4 the in-between programs (coffeehouse, health club, laundromat, restaurants) in the inhabitable poche of G are identified; from

which we can select elements a, b, c, and d to form X. However, this analysis also revealed a lack of an urban bedroom to fulfill the requirement for in-between living.

With the missing in-between program identified, the objective is to design an urban bedroom and make in-between living feasible. To this end, several criteria are taken consideration, including compactness, affordability, and flexibility. Following these criteria, the urban bedroom is designed as a translucent inflatable mask attached to the existing facades, facing the urban room (Figure 5). Each mask consists of four sleeping units, a toilet and a corridor for circulation (Figure 6). The size of a mask is 10 x 10 x 6 feet plus a narrow corridor of 2 x 10 feet, with the depth depending on that of the existing apartment units. When inflated, the urban sleeper is projected into the urban room (the in-between zone); when deflated it is flush with the existing facade (Figure 7).

Now we can define 'e' as the union of (n/4) urban sleepers, since each sleeper contains four sleeping units. At this point we have completed selecting all five elements for X. We still

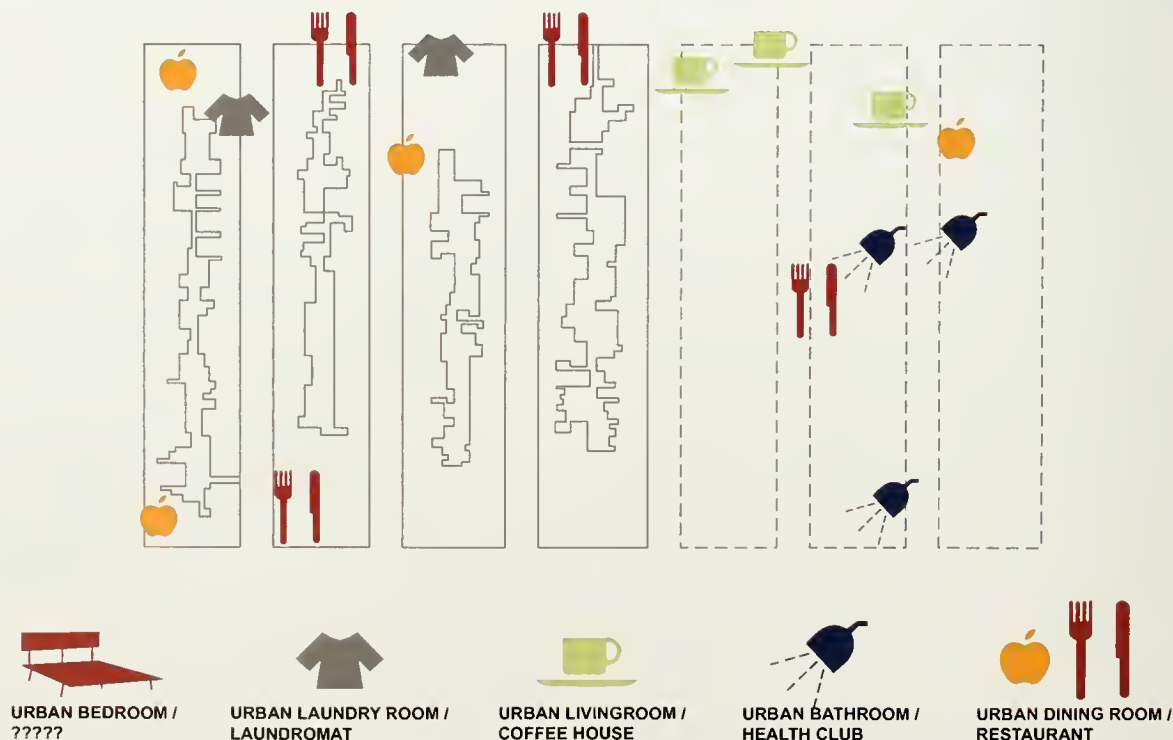


Figure 4

Figure 6



Figure 6

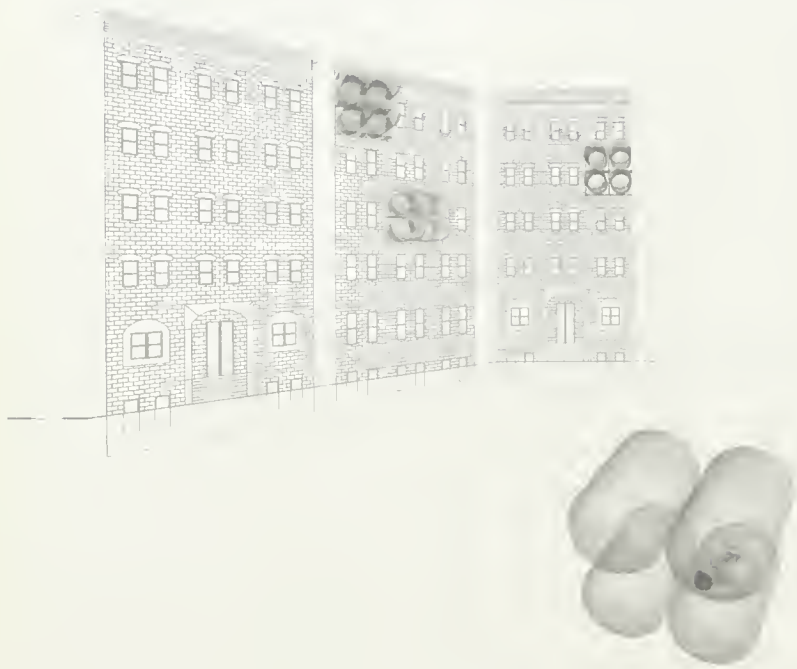


Table 1: Mathematics symbols

Symbols	Definitions
$>$	Greater than
\neq	Not equal to
\in	Element of
\cup	Union
\forall	For every
\exists	There exist(s)
$ $	Such that
$\{ \}$	The set of
\emptyset	Empty set
$f: X \rightarrow Y$	f maps X to Y
f^{-1}	Inverse function of f
\mathbb{R}	Real numbers
S^1	Unit circle

Figure 7

need to show that there exists a covering map $f: \cup X_i \rightarrow X$ such that $\cup X_i$ is an n -fold covering of X .

Definition 1.5: Let X and Y be topological spaces. A function $f: X \rightarrow Y$ is said to be continuous if for each open subset U of Y , the set $f^{-1}(U)$ is an open subset of X . Further, if f is bijective⁵ and if both the function and the inverse function $f^{-1}: Y \rightarrow X$ are continuous, then f is called a *homeomorphism*.⁶

Example 1.6: The function $f_i: X_i \rightarrow X$ defined by $f_i(x_i) = x$, for $x = a, b, c, d, e$, is bijective and continuous. Its inverse function $f_i^{-1}: X \rightarrow X_i$ such that $f_i^{-1}(x) = x_i$ is also bijective and continuous. By Definition 1.5, f_i is a homeomorphism. For instance,

if $i = 4$, then $f_4: X_4 \rightarrow X$ and its inverse function $f_4^{-1}: X \rightarrow X_4$ are defined by

$$\begin{aligned} f_4(a_4) &= a, & f_4^{-1}(a) &= a_4; \\ f_4(b_4) &= b, & f_4^{-1}(b) &= b_4; \\ f_4(c_4) &= c, & f_4^{-1}(c) &= c_4; \\ f_4(d_4) &= d, & f_4^{-1}(d) &= d_4; \\ f_4(e_4) &= e, & f_4^{-1}(e) &= e_4. \end{aligned}$$

Definition 1.7: Let $f: X \rightarrow Y$ be a continuous surjective map.⁷ The open set U of Y is said to be evenly covered by f if the inverse image $f^{-1}(U)$ can be written as the union of disjoint open sets V_α in X such that for each α , the restriction of f to V_α is a homeomorphism of V_α onto U . The collection $\{V_\alpha\}$ will be

called a partition of $f^{-1}(U)$ into slices. If every open set U of Y is evenly covered by f , the f is called a covering map, and X is said to be a covering space of Y .⁸

To help visualize Definition 1.7, we can picture the set $f^{-1}(U)$ as a “stack of pancakes,” each having the same size and shape as U , floating in the air above U ; the map f squashes them all down onto U .⁹ (Figure 8)

Figure 8

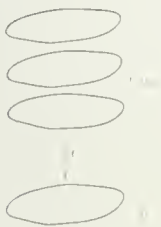
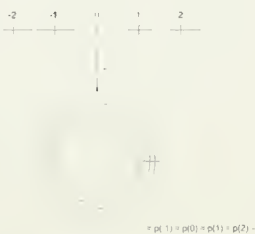


Figure 9



Example 1.8: The map $p: \mathbb{R} \rightarrow S^1$ given by the equation $p(x) = (\cos 2\pi x, \sin 2\pi x)$ is a covering map. In this case, we can think of p as the function that wraps a line around a circle, as shown in Figure 9.

To continue with the proof, let $f: \cup X_i \rightarrow X$ be the map defined by

$$f(x_i) = x, \text{ for } x = a, b, c, d, e \text{ and for } i = 1, 2, \dots, n.$$

Then f is continuous and surjective. Since

$$f^{-1}(x) = \cup \{x_i\} = \{x_1, x_2, \dots, x_n\},$$

$f^{-1}(x)$ is an union of disjoint open sets. In addition as shown in Example 1.6, the restriction map of f to x_i , $f_i: X_i \rightarrow X$, is a homeomorphism of $\{x_i\}$ onto $\{x\}$. By Definition 1.7, $\{x\}$ is evenly covered by p .

This also proves that f is covering map and $\cup X_i$ a covering space of X , as the discrete topology on X is generated by the collection of a, b, c, d , and e ; it is sufficient to show that a, b, c, d , and e , are evenly covered by f . Lastly, since $f^{-1}(x) = \cup \{x_i\} = \{x_1, x_2, \dots, x_n\}$ has n elements, $\cup X_i$ is indeed an n -fold covering of X (Figure 10). QED

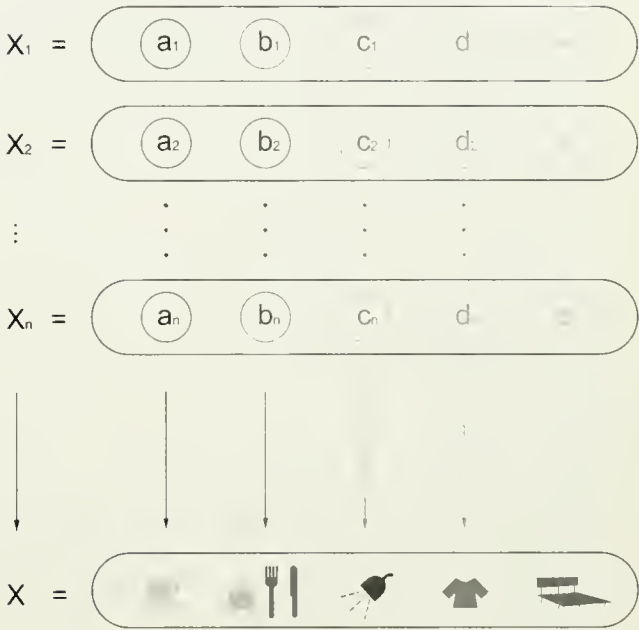


Figure 10

Thus we’ve successfully “squashed” n dysfunctional housing units onto one new habitat for n city-nomads. Hurray for in-between living!

Notes

1. E.B. White, *Here is New York* (The Little Bookroom, 1999), 51.
2. Refer to Table 1 (p.80) for all mathematics symbols.
3. James R. Munkres, *Topology: a first course* (Prentice-Hall, Inc., 1975), 76.
4. ‘In-between’ is being or occurring at an indefinite and unsettled middle place between extremes.
5. A function $f: X \rightarrow Y$ is said to be *injective* if $\forall x, x' \in X, f(x) \neq f(x')$. It is said to be *surjective* if $\forall y \in Y, \exists x \in X$ such that $f(x) = y$. If f is both injective and surjective, it is said to be *bijective*.
6. Munkres, 311.
7. See note 5 above.
8. Munkres, 331.
9. *ibid.*, 331.

B. Alex Miller

The Great American Garage

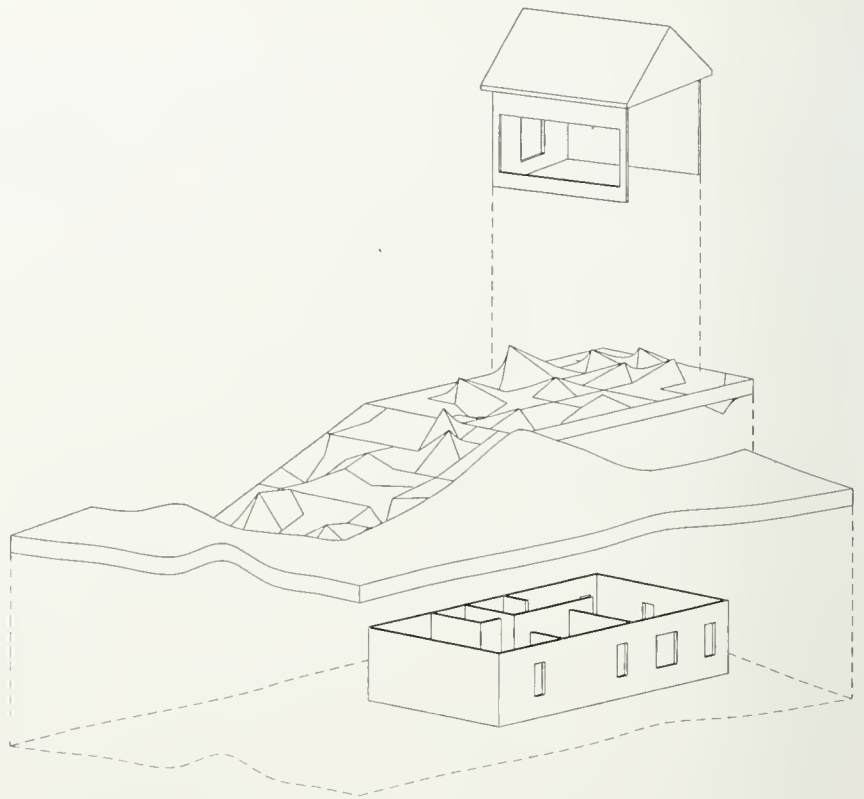
An Exploration of Suburbia

How does one explore the suburban home?
Go in through the garage, of course.

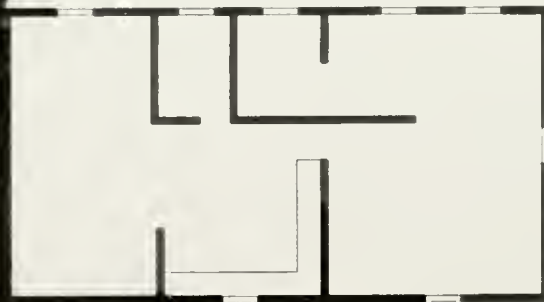
Excerpted from the author's
Master's thesis entitled *The
Great American Garage*

Sales, bands, suicides, and business startups: The suburban garage is the most culturally flexible space in the entire American domestic environment. In this flexibility, it stands opposed to many of the established notions of suburban domestic context. It is illustrative of the displayed, hidden, and forgotten wonders of the American home.

Within the context of this thesis, established interpretations of the garage program are used in the form of metaphor and hyperbole to create differing typologies of the American home. The metaphors themselves have developed out of a very dense genealogy of American suburban histories and trajectories. They have a real history, just as they occupy a very real extant condition of the suburban context. The new suburban house typologies march toward the space of the surreal via the narratives that accompany each of them, allowing for an exploration into the existing domestic condition as well as a feverish and jocular critique of some of the norms of suburban life. This research attempts to take on the exploration of American suburbia, using the very stereotypes and clichés that have come to define it.



Trophy House Axon



Trophy House Plan

Trophy House

Beautiful and shiny SUVs are parked on top of the houses like the Greek goddesses adorning the tops of trophies. Neighbors have told me how hard it is to imagine how plain everything looked before the driveways were put in; no one can picture gable upon gable upon gable into the distance. I've tried to explain that you couldn't see all of the roofs in this manner anyway. I mean, how often do you suppose people were up on the roof before the driveways were put up here?

Every week or so, a community gathering is organized at one of the homes in the neighborhood. It is a celebration of sorts, similar to the christening of a new ship. The crowd gathers at the base of the trail that leads to the home's garage to watch the family bring home the perfectly polished SUV for the first time. All of the preparations have been made: the entrance wall to the garage has been rebuilt, with the entire family contributing to the ritual of replacing studs and vinyl siding. The M.G.P.¹ has been altered considerably since the family's last SUV purchase, elevating the challenge to a new height for the entire neighborhood; nobody has seen a trail this difficult since the Smiths bought their Hummer H6 a year ago. The SUV arrives to a quiet smattering of claps from the crowd of neighbors (the restrained applause seems to speak both to the expectations of more excitement to come and to the barely hidden pangs of jealousy from neighbors). As the SUV makes its gradual ascent through the challenging terrain, the crowd cringes and gasps at the feats accomplished by such a magnificent vehicle; a lone whisper of "...how much do you think we'll have to spend to change our M.G.P. to top this?..." breezes through the small cul-de-sac sized cluster of onlookers.

The automobile pauses momentarily just outside the garage façade, and the entire family piles up inside for the heroic conclusion of the ritual.² The children are buckled in and the baby seats are checked one more time for safety. Finally, the SUV revs up (mostly a little show by Mrs. Wilkenson, who has been waiting for some time to get her turn at the garage façade) and the brakes are released. The SUV violently crashes through the face of the garage, rendering it in shambles and returning it to a state similar to that of all of the other homes in the neighborhood (except for the Williams's of course, who are preparing their garage for SUV use in the next few weeks).

1. M.G.P. stands for Manipulated Ground Plane, a term first coined at Harvard's influential Graduate School of Design in Cambridge, Massachusetts.

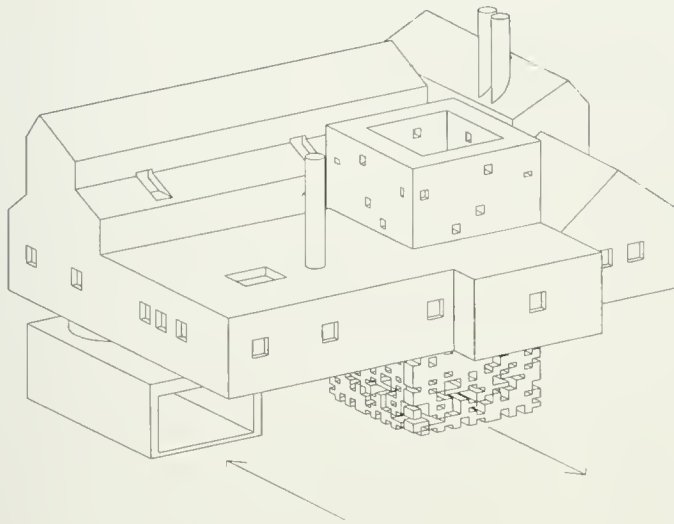
2. The father and the children had been waiting patiently at the top of the trail for the mother to complete the ascension. This was, after all, Mrs. Wilkenson's SUV. Mr. Wilkinson had brought his SUV home more than a year ago to a lukewarm reaction from the neighborhood. The family decided to make a much bigger impression with the neighbors this time around.

Tchotchke House

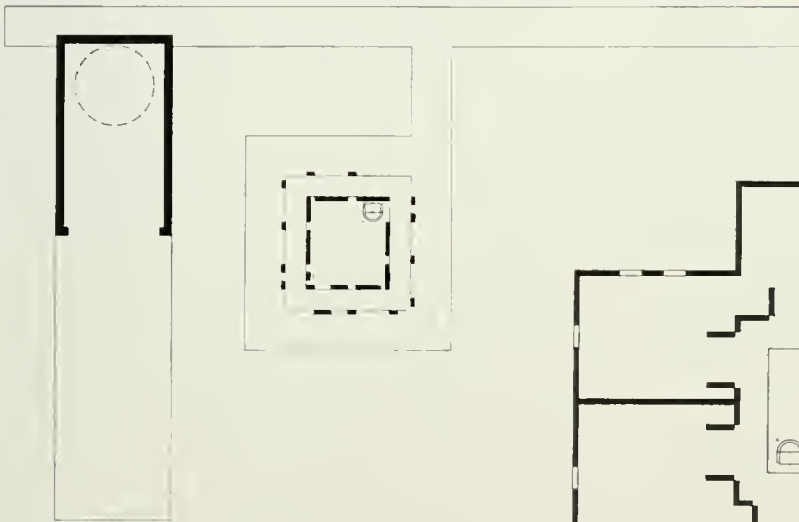
It's the day after Thanksgiving, and just like every year, the neighborhood is crammed with automobiles from the city. It is a magnificent site to behold, with car upon car along the streets and the cul-de-sacs full of shoppers. Hundreds of people stroll along suburban sidewalks, looking intently at each of the homes as they pass by, wondering where their next bargain might appear. The home-owners peer out of windows, looking down proudly at the crowds gathering in their neighborhood and around their jewel box. Every day now, the children of the home are allowed to climb down the cataloguing ladder to the jewel box's base and choose one item to rotate to face the shoppers. Such a treat this has become.

The girls sneak through their bedroom closet and enter the cataloguing space. They take turns gliding past all of the stored items of holidays and birthdays from the not-so-distant past. They slowly make their way downward through the column of wonderful things: old wall clocks without any hands, a box of old magnifying glasses with their lenses removed, and their favorite item, an old wine bottle wrapped in a bull's hoof. As they reach the bottom of the space, one of the girls peeks through the hole of a recently emptied display box to see a little boy on the other side; he waits anxiously to see if there is going to be anything turned to the outside anytime soon. A smile is exchanged, and the girl on the inside of the jewel box carefully chooses a special item, unlatches a brass clasp, and rotates the storage box and its contents for the boy to see.

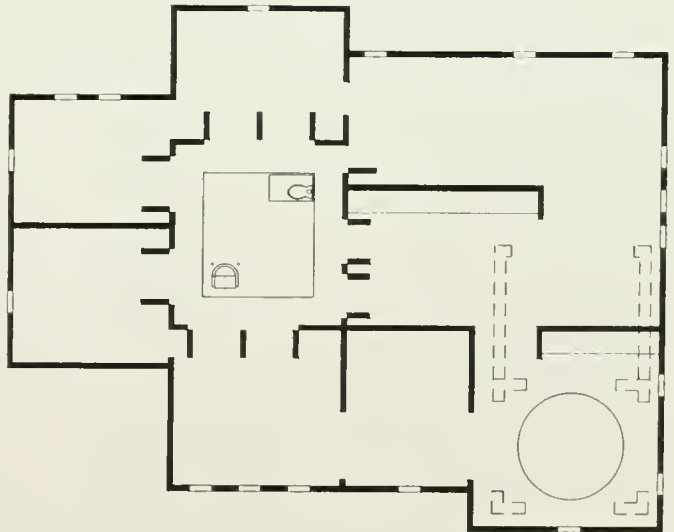
The boy hops with excitement and turns to his mother and father, who are watching him from a close distance. The mother nods her approval and places the money into wood-lined vending control, selects the appropriate display box number, and watches as the glass panel is slowly opened to allow for gift's removal.



Tchotchke House Axon



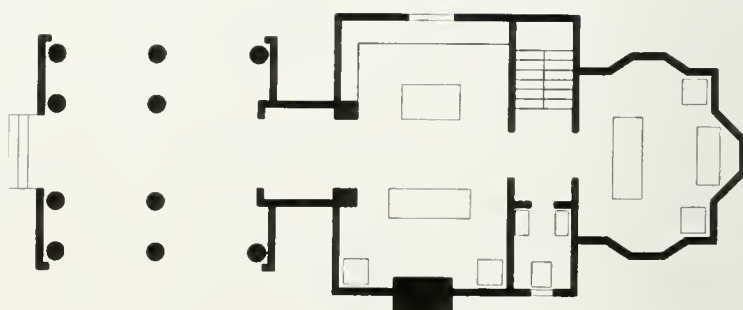
Tchotchke House Plan
(First Floor)



Tchotchke House Plan
(Second Floor)



Temple House Axon



Temple House Plan

Temple House

The family walks up to the steps of the entry portico, where the father stops to chastise the children for clowning around too much as they prepare to make their way inside the temple. Ties are adjusted, shoes are tied, and hair is combed quickly as the family slowly makes its way up the steps and into the portico. The kids wander to one of the columns of the space and slowly run their hands up and down it. The text is illegible, but the children are enamored with its texture on the cold, smooth vinyl.

Mom and Dad arrive at the entrance to the temple and remove their shoes at the ceremonial mat.¹ They slowly cross the threshold into the cleansing space, and the sound of trickling water surrounds them. One by one, hands are dipped into the water and rubbed together before they are dried with the piece of red cloth that hangs against the dull white wall.

The children, nearly asleep from the monotony of the procession, quickly catch up to their parents and follow them closely into the space of communion. Small doors are opened intermittently to

view the necessary items, and a silver plate is prepared for each family member. A brief ceremony of exchange follows; items are removed from one cabinet and placed in a lighted version of another. Both Mom and Dad bow individually to the items in the lighted cabinet and complete the arrangement of the plates (a standard custom, depending on the nature of the communion itself).

Finally, the children begin to get excited as the family enters the final space of the procession. The blinds are closed over all three sets of bay windows flanking the space, and each member seeks out a comfortable place in which to pay homage. Dad reaches over while still seated and opens a very small and ornate oak cabinet that contains three religious talismans: one for the TV, one for the cable box, and one for the DVD player.

1. The mat has a script on it that reads "welcome," and is printed with an ornate pattern of flowers on its edges.

Neyran Turan

Spatial Formats

Oil and Gas Fields of the North Sea

The parallelism between globalization and digitalization provokes discussions on the status of virtual and actual borders within the urbanism of late capitalism. In addition to the arguments around the “fuzzy” borders of the digital world, the emphasis of current theorists has shifted to the actual spaces and borders of urbanism. Sociologist Saskia Sassen claims not only that the world may be becoming more global and digital, but also the digital world illustrates new spatial modes. She argues that the embeddedness and interconnection of the digital with actual physical spaces, as well as the inevitable re-scalings of urbanism are the current issues in need of discussion.¹

In Sassen’s argument, the virtual connotes the digital and the actual demarcates physical structures (airports, buildings, lands, infrastructure). Rather than the digital connotation of virtuality, this essay will discuss a new category of unconventional spatial formats as a new form of virtuality. Invented by the organizational and political imagination of various global agents, these spatial formats are the corollary to the necessary exploration of un-exposable or un-exploited space of the earth. They survive by virtual qualities, but compose actual architectures and form *virtual actualities*. Their virtuality is not digital but political. They are modes of inscription or coding where space has become a volatile vacancy.

The resource activities (explorations for fossil fuels on the North Sea) are an eccentric exploration event over the sea’s surface whose process oscillates between the acts of inscription, appropriation, de-appropriation and re-appropriation. The resource conflict, the general disputes over fossil fuels, of the sixties concluded with the re-conquering of the sea as a resource terrain. One of those conquered terrains was the North Sea, which affected and was in turn affected by several urban and political conditions.

Incription_1: Survey

After the initial discoveries of fossil fuels in the sixties, the North Sea became an unexplored seismic survey area. Seismic survey is a technique that searches the underground layers of the earth by sending sound waves through them. Seismic sur-

vey lines were the first modes of inscription over the sea surface, deployed along the regular routes of the seismic survey ships that scanned the sea. The survey lines, as modes of inscription, coded and recoded the sea according to technological advances and politically charged resource activities in the world. While the distance between the survey lines changed one-and-a-half to six-and-a-half miles depending on the acquisition of the data, the stratum between the lines were all unknown territories whose geological structure had to be *spatialized*. Over time, to make the geological data more accurate, these lines began to converge by defining and redefining different spatial lapses. (Figure 1) Inscriptions and spatial codings territorialized the sea, which would then be de-territorialized and re-territorialized by other global resource activities.

Inscription_2: Maritime Boundaries

Striations and inscriptions on the North Sea virtually correct and materialize various theoretical contemplations.² Different levels of inscriptions not only striated the North Sea but also prompted, and were prompted by, various political activities and constitutions. That is, as well as the physical terrain of the sea, wider landscapes were also the sites of activity. The determination of the Continental Shelf among the North Sea countries was the second level of inscription in the process of exploration.

In Roman Law, only occupation of the seabed would yield ownership of the land. The sea and the subsoil were then considered as *res nullius*, a legal term used to describe physical things “which have not or have never had an owner,” or a category of “things that have not been reduced to property.”³ Although the subsoil could also be privately owned by effective occupation, some high authorities accepted the subsoil as *res nullius* but were considering the seabed as *res omnium communis*, “the property status of such a thing that cannot be appropriated, and is common to all.”⁴

The law of the Continental Shelf was a phenomenon explored in the twentieth century by conquering the sea as a resource area. Since the seventeenth century, “territorial waters” had

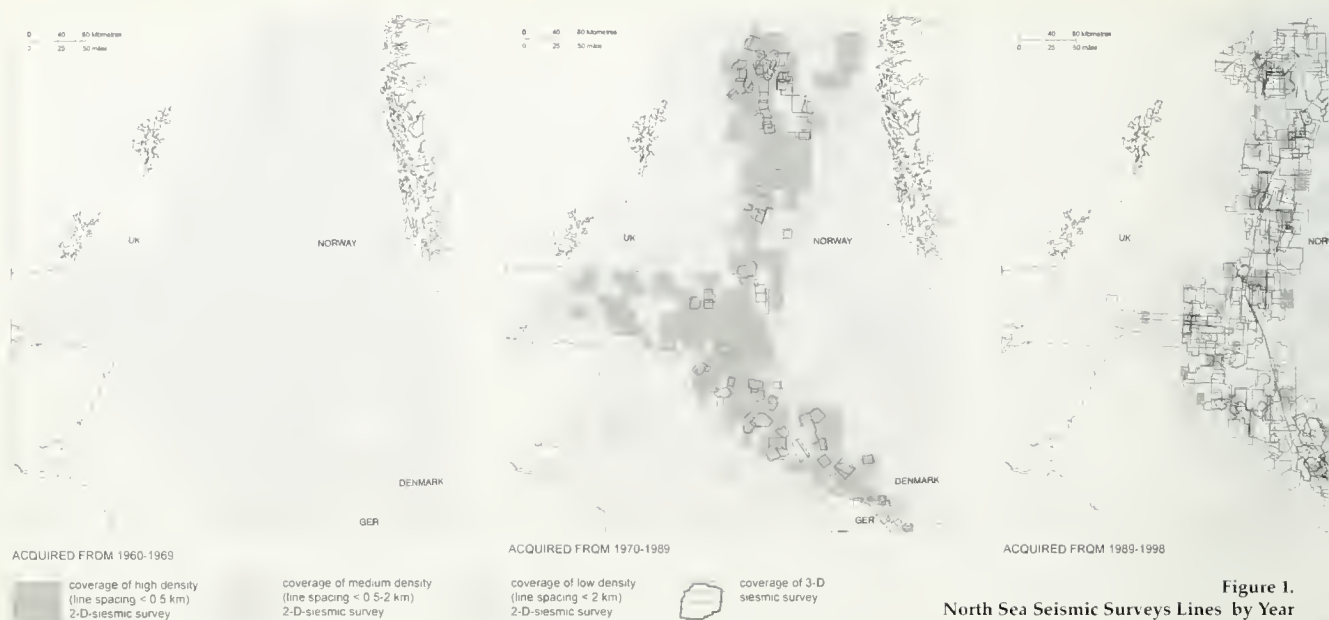


Figure 1.
North Sea Seismic Surveys Lines by Year

limited by many western countries to a distance of between three and twelve miles from their coasts. After World War II, a more global view of the world began to replace the perspective of individual states; and a number of coastal countries claimed exclusive jurisdiction over the natural resources of their coast. In 1958, the International Law Commission of the United Nations held the first Conference on the Law of the Sea.⁵ The conference adopted the Convention on the Continental Shelf during the Geneva Convention, which gave each coastal state exclusive right over its own continental shelf "for the purpose of exploring it and exploiting its natural resources."⁶ This Convention provided the first internationally accepted definition of the term "Continental Shelf," as "All the seabed and the subsoil of the submarine areas adjacent to the coast but outside the territorial waters to a depth of two hundred meters, or beyond that limit to where the depth of the superjacent waters still permits exploitation of natural resources in such areas."⁷

The Geneva Convention also proposed that a median line formula would be applied to international waters that were less than two hundred meters deep. Since the seabed of the North Sea constitutes a continental shelf with a depth of less than two hundred meters, the boundaries between Norway, United Kingdom and the Netherlands were established in 1964. The delimitations between Germany and Denmark were announced in 1971, after years of negotiations.

Inscription_3: Appropriation

After the states claimed the sea, the next step was the licensing of each country's continental shelf: the *appropriation* of the sea. Here I use the word appropriation by referring to both connotations: "property" and "propriety" –where the latter en-

compasses the need for an *appropriate* organization of the sea. Through legislation, the seabed and soil constituted a new form of state property, operated by both state and transnational corporations.

As large parcels of American land had been appropriated by the grid system, the North Sea also applied the grid for licensing oil and gas fields. The system of legislation was, as in properties on the land, a means of control and subdivision. The subdivided territories were named in the smallest unit of property on the sea, the "block." Exploitation occurred only on the parcels that contained resources, that is, the system of appropriation was that of regulating vermiform oil and gas fields.

In 1962, two years before the Continental Shelf legislations of the North Sea, many oil companies had already conducted surveys in its international waters, where governments had no legal means of regulating their activities. The nations surrounding the North Sea were completely unprepared to give quick answers to the complex legal and political questions raised. The landscape required a new set of organizations. After resolving questions such as, "What are the boundaries of the nation's continental shelf?" and "Whose property was the strata that lay on or under the nation's continental shelf?" "Under what conditions would exploration and production rights be established?" was the next question faced.

A common feature of the licensing systems in all of the countries of the North Sea was the approval of numbered one-degree quadrants (one degree north-south and one degree east-west), though the number of blocks per quadrant differed.⁸ For instance, in Norwegian waters each quadrant was subdivided to twelve blocks and in the UK, it was thirty. While offshore

oil companies demanded larger blocks that would allow the maximum freedom to explore, state committees were more inclined to keep the size of the blocks relatively small. Although the striation of the sea through blocks was the same process for all countries, the size of the blocks each illustrated each country's own legislation system. The North Sea became one intact organizational space with these discrete proto-organizational systems and identities.

The elastic forms of the oil and gas field boundaries necessitated elastic striations on the North Sea. The term elasticity here refers to both to the changing organizational status of the properties on the North Sea and the adaptation of the striation or block system to the irregular forms of the resource fields.

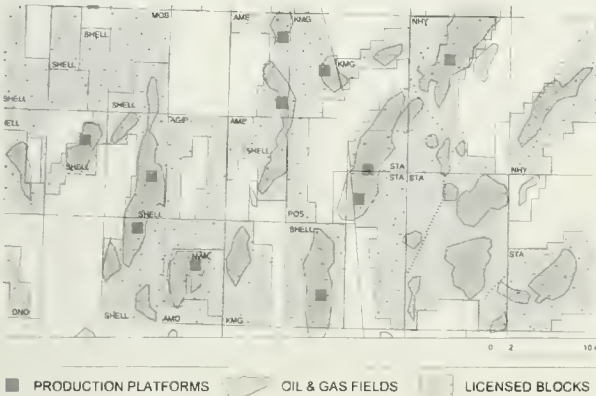


Figure 2. Adaptation of The Grid Block System to Vermiform Resource Fields

Therefore, the juxtaposition of the boundaries of the oilfields with the Cartesian grid block system, created the sea as a three dimensional entity of virtual boundaries, consisting of the grid system, the Continental Shelf boundaries, and the complex resource field margins concluded with unconventional systems (Figure 2). Because of the complex nature of the geological stratification, the rectangular block margins did not indicate a direct three-dimensional prism extending down to the oilfields, “keeping the in line or proper” was difficult. Thus, the so-called platform injectors extended down through the reservoirs within the limits of the inscribed grid strata.¹⁰ The organizational status of the properties displayed elastic inscriptions on the sea reflecting new oil and gas discoveries. Appropriations and inscriptions coded and re-coded the same area with changes. The dynamic distribution of blocks over time can be read as a history of *virtual actuality*. (Figure 3)

Inscription_4: New City

After each area on the sea was appropriated to blocks, the oil platforms or what I would call “delirious” resource cities started to invade the North Sea waters. With accommodation for

about two thousand workers, sport centers and other facilities, oil platforms were the new cities of the North Sea. The abundance of physical evidence inherent in the site embodies a latent manifesto of political and social inscriptions.¹¹

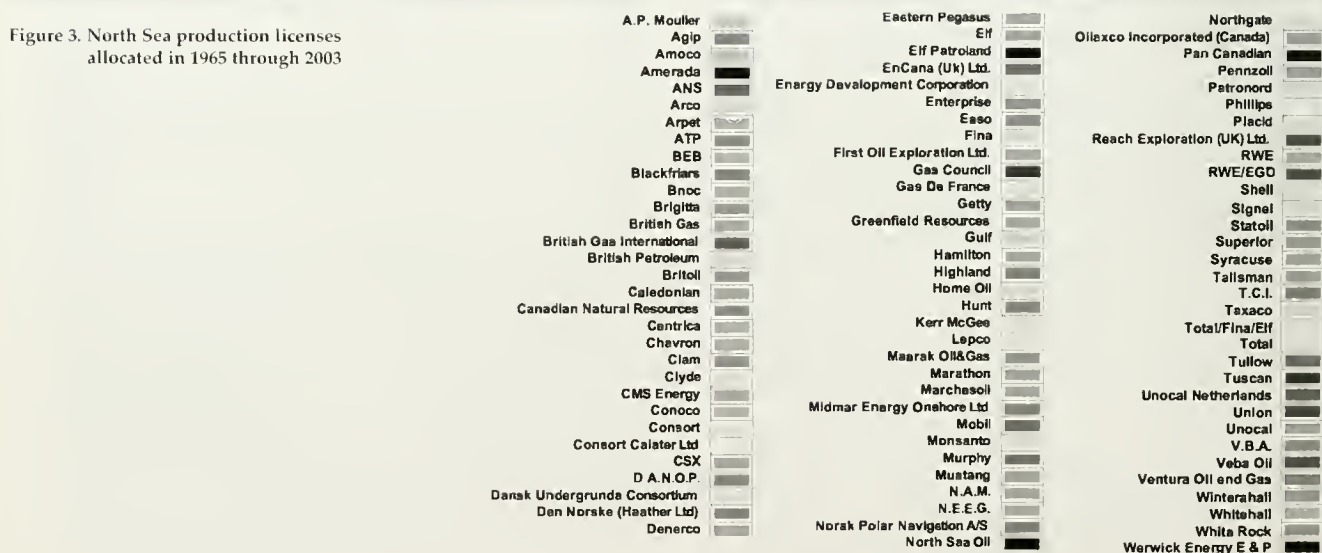
These infrastructural network systems were also expanding through land to different continents. Although the sea was subdivided through several systems such as Continental Boundaries and blocks as discussed above, the organizational systems of the oil platforms and pipeline infrastructures exposed a latent urbanism that extended the boundaries of the North Sea. This *New North Sea City* had unconventional rules, being not only an international platform for the offshore countries surrounding the sea but also a hub within an international pipeline network. The story of this new city was far different than that of a city settlement on the land. The platforms were *settled on* the fields within their allocated properties, the platforms were linked to each other and the landscape of resource activity inserted itself into a worldwide organizational system. (Figure 4)

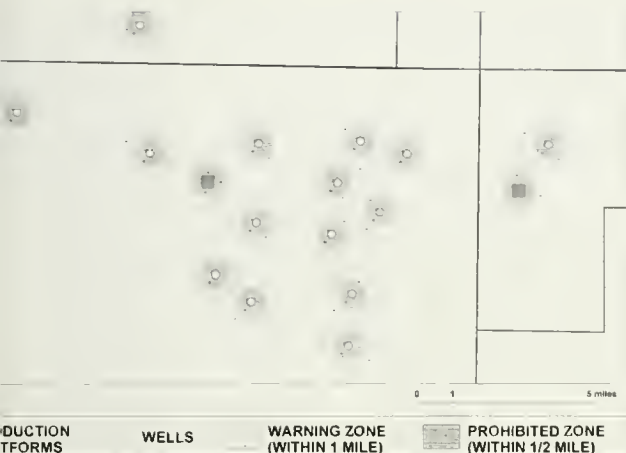


Figure 4. Network Cities on the North Sea



Figure 3. North Sea production licenses allocated in 1965 through 2003





5. Prohibited Zones

Inscription_5: Other Virtual Zones

The New North Sea City not only inserted itself into a wider network of political organizations but also affected the ways in which activities occurred on the sea surface. For instance, the buildings of the cities (platforms and other oil and gas installations)¹² not only defined an unconventional layout but also demarcated other virtual zones that would affect the shipment routes conducted across the North Sea. Under international law, coastal states established prohibited zones around these installations for safety purposes. A five hundred meter safety zone surrounded the installations. Buoys were moored as much as one mile from production platforms to indicate a warning zone around the platforms.¹³ Each installation had its territorial boundary, which also created another latent zone of organization and inscription on the sea. (Figure 5) As a hub within a huge political network, this new city defined the concepts of actuality and virtuality. The resources it harvested amplified the appropriation activities on the North Sea while the subdivision systems called for special organizational structures far different than those on land, requiring a system of appropriation that regulated vermiform oil and gas fields.

Notes

1. Saskia Sassen, *Losing Control? Sovereignty in an Age of Globalization*, (New York: Columbia University Press, 1996).
2. For German political philosopher, Carl Schmitt, the sea is the fundamental element in world political theory [and human history is nothing more than an endless fight between nation-states whose power was based on the land and those whose power was based on the sea]. Carl Schmitt, *Land and Sea* (Washington, D.C.: Plutarch Press, 1997), trans. Simona Draghici. For Deleuze and Guattari, "The sea is perhaps principal among smooth spaces, the hydraulic model par excellence...[T]he sea is also, of all smooth spaces, the first one attempts were made to striate, to transform into a dependency of the land, with its fixed routes, constant directions, relative movements, a whole counterhydraulic of channels and conduits. Gilles Deleuze and Felix Guattari, "Treatise on Nomadology: The War Machine," *A Thousand Plateaus: Capitalism and Schizophrenia* (Minneapolis: University of Minnesota Press, 1987), 387.
3. Eric Engle, "Economic Theory of Law and the Public Domain: When is Piracy Economically Desirable," <http://lexnet.bravepages.com/media1.html>.
4. Ibid.
5. Donat Pharand, "The Law of the Sea: An Overview", Donat Pharand and Umberto Leanza, eds. *The Continental Shelf and the Exclusive Economic Zone: Delimitation and Legal Regime = Le Plateau Continental et la Zone Economique Exclusive*, (Dordrecht, Boston, London: Martinus Nijhoff Publishers, 1993), pp.5-6.
6. Re-quoted from Brent F. Nelsen. *The State Offshore: Petroleum, Politics, and State Intervention on the British and Norwegian Continental Shelves*, (New York, Connecticut, London: Praeger, 1991), pp.15-16.
7. E. N. Tiratsoo, *Oilfields of the World*, (Beaconsfield, England: Scientific Press Ltd., 1984), p.74. There are also some exceptions where the outer limit of the Continental Shelf extends the two-hundred-mile rule. For more information on Continental Shelf and legislation histories, see, Ron Macnab and P. K. Mukherjee, "The 1982 UN Convention on the Law of the Sea and the Outer Limit of the Continental Shelf: Some Practical Considerations for Wide-Margin States," Donat Pharand and Umberto Leanza, eds. *The Continental Shelf and the Exclusive Economic Zone: Delimitation and Legal Regime = Le Plateau Continental et la Zone Economique Exclusive*. In the Geneva Conventions of 1958, four maritime zones were identified: (1) the territorial sea, (2) the continental shelf, (3) the contiguous zone, and (4) the high sea. As the numbers of coastal states increased and the sea resources became important, there was a need for an increase in legislations for complex maritime situations. Accordingly, the 1982 Convention has also added to the abovementioned four zones the exclusive economic zone (EEZ), the international seabed area, and archipelagic waters.
8. Except the Norwegian ditch at south and southwest of Norway
9. There were two types of offshore licenses: (1) Production licenses (for searching, drilling and extracting petroleum, and (2) exploration or reconnaissance licenses which would allow exploration work other than deep (350m) drilling production. Licenses are awarded in licensing rounds and each license could be obtained anytime for three years.
10. While most of the oilfields at the North Sea are from Jurassic Period, the North Sea has been a unique offshore oilfield in terms of the distribution of the oilfields in various geological strata formed with millions of year differences.
11. Rem Koolhaas begins to his retroactive manifesto for Manhattan by saying that the "fatal weakness of manifestos is their lack of evidence." Rem Koolhaas, *Delirious New York: A Retroactive Manifesto for Manhattan*, (New York: Oxford University Press, 1978), 6.
12. These installations include wellheads and drilling rigs.
13. *The Defense Mapping Agency, Sailing Directions* (Planning Guide) for the North Sea and Baltic Sea, (Washington, D.C.: Defense Mapping Agency, Hydrographic/Topographic Center, 1990), Yale University Governments Document Center, pp.267-269, 273.

In memory of Professor Emeritus Imre Halasz (1926-2003)

An internationally renowned architect, urban planner, and teacher at the Massachusetts Institute of Technology, Professor Halasz died on July 3 of 2003 at his home in Boston after a long illness. He was 77.

Revered worldwide as a teacher, Halasz taught at universities in the United States and Canada as well as in Kyoto, Florence, Haifa, and Santiago. He was also a practicing architect in partnership with his brother, Anthony. Their projects included the feasibility and development plan for the NASA Electronics Research Center in Cambridge, Massachusetts (1968), the Don Bosco Technical High School in Boston (1971), a land reclamation project and urban development plan for Corinto, Nicaragua (1977), and a reconstruction plan for the historic district of Santiago (1978-79).

Halasz was born in Budapest, Hungary and studied at the College of Fine and Applied Art and the Technical University in Budapest, receiving his diploma in 1950. After postgraduate work at the Académie des Beaux-Arts in Paris and at the University of Leiden in Holland, he taught architectural design at the Polytechnic University of Budapest until 1956.

Halasz was on the architecture faculty at MIT from 1957-63 and from 1969 until his retirement in 1991. In the interim, he taught and advised in Chile, Peru and Brazil and was a visiting professor at Harvard University's Graduate School of Design from 1966 to 1968. After retiring from MIT as a full-time professor, he held the post of senior lecturer until his death.

Halasz received a Golden Diploma from the Technical University of Budapest in 2000. Two years later, he was elected a Fellow of the College of the American Institute of Architecture. He was a longtime member of the American Institute of Architects, the Boston Society of Architects, and the Architectural Association in London. He was an honorary member of the faculty at the Catholic University of Chile and the Chilean Society of Architects.

In 2002, a comprehensive book on the Halasz brothers' design accomplishments was published in the Hungarian Monograph Series, sponsored by the Hungarian Art Museum of Budapest and the Hungarian Foundation for the Advancement of Architecture. This series acknowledges the achievements of notable Hungarian architects who live and work outside their homeland.

Professor Halasz was much beloved by his students and had an enduring impact on the design culture of the department. “It is design thinking we are teaching,” he once stated in the pages of *thresholds*, “and we should be growing while making whole heuristic process evolve—it is open-ended but not open-ended by virtue of capriciousness but as the result of layered exploration of certain selected pieces chosen in the beginning. And those [pieces] (not programs, not places, not pre-determined problem-solving ideas) should come from the willing confrontation by the student with their own values as well as those aspects of architecture which at that stage of their growth they are curious about.”¹

Notes

1. As quoted in “Interview with Professor Halasz,” published in *Thresholds* 12 (Spring 1996); other information excerpted from *MIT News*, July 10, 2003.

“It is design thinking we are teaching and we should be growing while making whole heuristic process evolve – it is open ended but not open ended by virtue of capriciousness but as the result of layered exploration of certain selected pieces chosen in the beginning. And those [pieces] (not programs, not places, not pre-determined problem solving ideas) should come from the willing confrontation by the student with their own values as well as those aspects of architecture which at that stage of their growth they are curious about.” - Imre Halasz, *thresholds 12*

MIT thesis students advised by Imre Halasz:

1998 Eileen McHugh Ward, Jesse Wu, Soo-Hwa Yuan **1997** Willam Lackey IV, Deirde Terzian, Steven Bull, Willam Scholtens **1996** Audrey Godwin, Wendy Akemi Kameoka, Carlos Mateo Ridruejo, James Francis Rissling, Andreas L. Savvides, Alexander Peabody Stolz **1995** Albert Pui Lam Kong **1994** Radhika Bagai **1993** Zsuzsanna Gaspar **1992** Scott William Rabiet **1991** Judith N. Bookwalter, John Lai Yen Louie, Scott R. Pollack **1990** Chin Yuan Lin **1989** Noel Jonathan Brady, Yuri Kinoshita, Paul R. Ries **1988** Keith A. Campbell, Belen Hermida Rodriguez, Constantine Anthony Kriezis **1987** Gregory Faulkner, Heidi Johnson, Greta Jones, Stephanie Wingfield **1986** Arto Harjunpaa, Laurene Anne Hungle, Kim Sammis, Sandra Leigh Olson Snow **1985** James Beaudoin, Colin J. Flavin, Walter S. Rask, Jeffrey Schantz **1984** Michael David Sorkin, Albert Westley Spruill **1982** Raphael G. Olgiun, Jeffrey David Rhoads, August G. Schaefer, James A. Sobey, Michael Sela **1981** Philip Owens Belanger **1980** David George Cooper, Fernando J. Lugo **1979** William Leslie Kasdon, William Leete Rawn **1978** Ronald John Alex, George Thomas Tremblay **1977** Constantine Nicholas Thomas, Brian Hingpo Tse, Robert Gregory Turner **1976** William Chalmers Agnew, Claudia Miller Skylar **1975** Stephen Coburn Hayes, Vincent Samuel Hsu, Charles Woodrow Styron **1974** Sandra Cutting Auchincloss, Douglas Robert Coonley, Martha Elizabeth Ondras Stokes **1973** William Edward Holland, Barry Falk Kevin **1972** Robert Joseph Couch, Terry Stelios Hartzides, Isabel King **1971** Russ Van Vleck Bradley, Mercia Elizabeth Lee, David Curt Morris **1967** Scott Lee Danielson **1966** Ernst August Ibs, Mazen Nicholas Manasseh-Hawa, Nicholas Peter Negroponte, Richard Warren Smith **1965** Jerry Gibson **1963** Richard Meredith Titus **1961** Joseph R. Blair, William L. Kite, Richard Ira Kraus, R. A. Williamson **1960** Norman Drucker, Johannes Philippe Holschneider, Richard Baker Morrill, Radoslav Zuk **1959** Valdis Martins Alders, Neil Astle, Paul R. Dermanis, John M. Peterson

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Hsieh: All images by the author.

Miller: All images by the author.

Turan: All images by the author.

Contributors

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Raoul Bunschoten is the founding director of CHORA Architecture and Urbanism, which since 1993 investigated and practiced new forms of architectural and urban design. He is currently a Diploma Unit Master at the Architectural Association in London and the Berlage Institute in Rotterdam. He has published various books, including *Urban Flotsam: Stirring the City*, *Metaspaces*, and *Raoul Bunschoten: The Skin of the Earth*.

Chris Csikszentmihály directs the Media Lab's Computing Culture group, which works to create unique media technologies for cultural applications. Prior to coming to MIT, he was assistant professor of electronic art at Rensselaer Polytechnic Institute.

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Martin Hogue is an architect and assistant professor at Syracuse University. His work focuses on issues of site in architecture in a way that privileges cross-disciplinary linkages, most specifically with the fields of Land Art and Conceptual Art. His ongoing design research deals with an exploration of the ground line as an architectural project. He is currently doing research on the Bonneville Salt Flats in Utah.

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Hélène Lipstadt is a Research Affiliate of the School of Architecture and Planning and a former Visiting Associate Professor at the Department of Architecture, History Theory Criticism Section at MIT. The sociology of Pierre Bourdieu has served as the methodological framework for her numerous studies of architectural competitions, exhibitions, periodicals, and publication, and monuments. She is chairing a session at the Society of Architectural Historians 2004 Annual Meeting, in which the state of Bourdieu-inspired research in architecture will be examined.

B. Alex Miller is a recent graduate of MIT's Masters of Architecture program. He currently lives next door to the architectural avant-garde, and just down the street from the American Midwest.

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Bradley Pitts, originally from New York City, received B.S. from MIT's Department of Aeronautics and Astronautics in 2000 with a minor in Architecture and Visual art. In 2003 he finished his M.S. thesis, "Spacesuit: Space Craft," in Aeronautics and Astronautics. He is currently working at MIT and plans to pursue an interdisciplinary Ph.D. that would allow him to explore "humane performance in extreme environments."

Paraskevi Tarani studied Architecture in the Aristotle University of Thessaloniki. She is now a Ph.D. candidate and researcher in Department of Urban and Regional Planning and Development in the Faculty of Engineering, Aristotle University of Thessaloniki (research unit URENIO). Her research focuses on the territories of urban innovation, internationalization, and knowledge-based city development

Neyran Turan is a recent graduate from Yale University School of Architecture where she submitted her Masters' thesis entitled "Detecting Latent Landscapes" in May 2003. She is currently teaching at the Architecture School of Istanbul Technical University, Turkey.

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Baroque



"The Baroque building," in Henry Millon's words, "can only be grasped through one's experiencing it in its variety of effects. ...Baroque unity is achieved—at the expense of the clearly defined elements—through the subordination of individual elements to invigorate the whole. Baroque space is independent and alive—it flows and leads to dramatic culminations." Indeed, the Baroque stands as a distinctive period in the history of Western art—one typically identified with monarchical absolutism, the Catholic papacy, colonial expansion, Newtonian science, and the rise of a series of aesthetic values having to do with exuberance, sensuality, extravagance, and spectacle.

Thresholds 28 is dedicated to Professor Henry Millon whose distinguished career has ensured the vigor of the field both of architectural history nationally and internationally. He has served as director of the American Academy in Rome and, until recently, as dean of the Center for Advanced Study in the Visual Arts at the National Gallery of Art in Washington, D.C. Since the late 1950s, he has been a member of the faculty in MIT's Department of Architecture, and is credited as one of the founders of the History, Theory, and Criticism Section of Architecture and Art.

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We welcome responses to current *Thresholds* articles. Responses should be no more than 300 words and should arrive by the deadline of the following issue. **Submissions by e-mail are not permitted without the permission of the editor.**

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